The Iron Age

A Review of the Hardware and Metal Trades.

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The Architectural Utility of Iron.

Relative Strength of Cast and Wrought Iron —Methods of Building with Iron.

III.

The methods of building with iron are interesting. All calculations in this department of architectural art are based upon correct estimates of the relative strength of wrought iron and cast iron. From a want of exact knowledge on this subject arose many of the mistakes in early iron construction. The strains to which iron is subjected when used as a building material call out its strength in various ways, according to its specific application. The tensile strength of iron, for instance, is exhibited in the tie of a roof in counteracting the thrust, or in the lower member of a girder. Its strength to resist a crushing strain is called into play in columns, arches or struts. A transverse stress is borne when iron beams are used. A shearing stress is sustained usually by rivets. A strain of torsion also occurs in certain cases. Beside its strength to resist rupture, iron must possess stiffness and elasticity, durability and hardness. In all these respects, cast and wrought iron differ.

CAST IRON.

The tensile strength of cast iron, or its power to resist a strain applied to stretch it in the direction of its length, is quite small as compared with its resistance to crushing forces. From five to seven tons is regarded by various experimenters as the average force that will break a bar one inch square; it must be remembered that these, as well as all other figures given, can only present the results of a certain series of experiments. The variations due to the use of different kinds of cast iron in these experiments are very wide. Not only does a difference in the grade of iron establish a variation, but the same grades of iron from different makers give widely different results. The power of iron to resist a crushing force was understood earlier than its resistance to a breaking strain. It is with reference to this ability to resist a crushing force that cast iron is especially valuable. The average resistance of a bar of iron one inch square to a crushing strain is about six times its tensile strength.

In relation to the resistance of beams to a transverse strain, some interesting experiments were made at the Excelsior Iron Works on the 29th of June, and reported in *The Iron Age* at that time. The first beam tested was one of the I form, the width of the upper and lower flanges, respectively, being 3⅛ and 12¼ inches, and the length of the web 19¾ inches. The thicknesses were 1⅛ and 2 inches for the upper and lower flanges respectively, and 2 inches for the middle of the web. The sectional area in the middle was, therefore, 47·7 inches; the weight required to break the beam was 50 tons, and the deflection of the beam at the time of breaking 1⅝ inches. An arched girder was also tried. This had an iron tension rod 2¾ inches in diameter, and is the form of girder commonly used to sustain four stories of 12 inch wall. Its sectional area at the center was 28·6 inches; its breaking weight, 34 tons. The transverse strength of cast iron beams is greater in proportion in those of small size than in large beams.

To secure safety it is always provided that cast iron beams shall never be loaded with more than from one-third to one-quarter of the amount that would break them in case of a stationary load and one-sixth for a moving load, as in the case of a bridge. This is known as its ultimate working strength. The reasons for this rule are that a very wide variation exists in the ultimate strength of cast iron, and also that although the material will not break until a certain weight is applied, yet it becomes very much weakened and permanently impaired by a heavy weight, long before this point is reached. If, however, the proper limits be observed, no sensible diminution in strength takes place by a constant repetition of a strain or by the long continuance of a load upon the beams. Changes of temperature within moderate ranges do not produce any material alteration in the strength of cast iron. Beyond a temperature of 600° Fah., however, it weakens very rapidly. Atmospheric changes also produce no appreciable change in the length of cast iron so as to impair the solidity of the structure into which it enters. Observations on cast iron structures which have been exposed to very considerable changes of temperature, show that the elongation and diminution is very slight.

Cast iron endures atmospheric influences better than wrought iron, and it was for a long time used as a material for beams by Smeaton and other engineers. Wrought iron, however, has superseded it in this use, not only on account of its superior strength in resisting transverse strains, but because cast iron is so exceedingly untrustworthy. It is liable to contract unequally in cooling when first cast, producing spongy places and strains in various portions of the metal. Holes may occur in a casting, also, where air and moisture have gained access to the mold. It also apt to be brittle. The best iron castings sometimes split with a loud report, and serious accidents have occurred from the use of girders of this material. One of these happened at King's College, England, where the whole dining room was destroyed by the giving way of an imperfect cast iron beam.

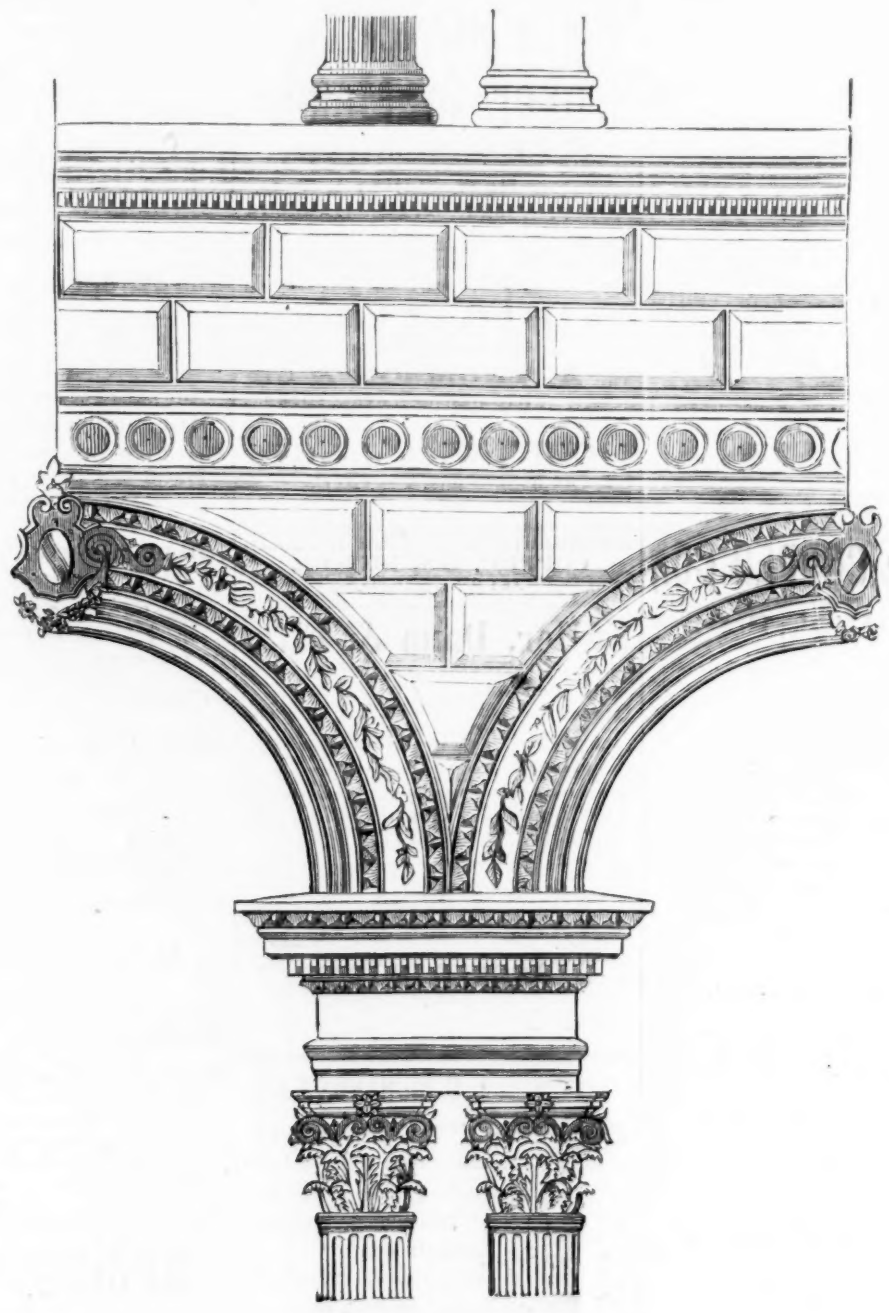
WROUGHT IRON.

The pre-eminent advantage of this kind of iron is its capacity for resisting tensile and transverse strains. As in the case of cast iron, so in wrought iron the resisting power for different qualities of the metal varies. The average resistance to fracture from a tensile strain is fixed by some experimenters at 25 tons per square inch, and no iron is regarded as fit for building purposes which will not stand at least 20 tons per square inch. When subjected to such a strain, the bar contracts in diameter, the amount of contraction depending on the quality of the metal, and, in some cases, amounting to 50 per cent. When the iron is exposed to a strain it elongates, but upon being relieved from the load it returns very nearly to its original shape. This new condition is known as the permanent set, and no matter how frequently the same load is applied, the metal will return to this "set" when the strain is removed. Wrought iron, however, ceases to be perfectly elastic when the strain is increased above ten tons. The resisting power of wrought iron varies with the square of the diameter of the bar.

Under a compressive force wrought iron is reduced in length one-ten thousandth of an inch for every ton per square inch up to 13 tons. Beyond this point the compression is greater.

Wrought iron is also valuable on account of its toughness, which renders it capable of resisting shocks and irregular strains, the softer irons being the best to withstand vibrations. Large masses, also, are not as strong, proportionately, as small ones, as they are apt to be irregular in density. Rolling improves toughness. Heat does not affect wrought iron materially under 350° F., or unless the temperature is lowered very much, and in the latter case the iron becomes very brittle. Over-heating wrought iron weakens it, and gives it that peculiar condition known as "burnt."

Wrought iron is very subject to oxidation, on account of which it should be protected. It may be painted or galvanized, and must be especially guarded wherever joints or polished surfaces occur. For the latter purpose a coating of tallow and white lead is used. The effect of oxidation is a more serious matter where the bars are of small diameter than when they are large, as in the former case the oxidation of the surface is greater in proportion to the thickness. For this reason English engineers now use, in the case of small bars, a bar twice the thickness of those formerly used. Wrought iron construction is more costly than cast iron work; the material used is more expensive, and the cost of working greater. As less material may be employed, however, no excess of metal on account of untrustworthiness having to be provided for, the actual cost of wrought iron work is not more than in the case of cast iron.



PIERS, PANELS, ARCHES, ETC., OF IRON BUILDING.

THE METHOD OF BUILDING IRON STRUCTURES.

It is impossible to describe accurately all the details involved in the erection of iron buildings in such an article as this. Different builders employ different methods in this, as in all other departments of construction. There are, however, many features common to every method of erecting iron buildings, which are interesting. The first point to be observed in this department of construction is the proper disposition of the wrought and cast iron portions of the structure. The former should be placed in every place where a tensile, or transverse, strain is to be borne, and the latter where a crushing force is sustained. Another fundamental consideration is, that the working strength of all the parts shall be duly considered and each made of sufficient strength to sustain a greater strain than will ever be brought to bear upon them. Many architects have taken too much advantage of the strength of iron, and reduced the size of their columns and girders to a very dangerous extent.

There are but few buildings composed entirely of iron, in which the beams, columns, walls, roofing, stairways, skylights, wainscoting, window frames, vaults, etc., etc., are all of iron. Many so-called iron buildings have simply iron fronts or facades anchored to the walls. In others the walls are of brick or stone and the interior supports of iron. The foundations in all cases, however, are composed of some other material than iron. Upon the solid earth and below the frost line is placed a bedding of concrete generally about 12 inches deep. Into this is set a pier of stone consisting generally of three or more stones from 4 to 7 feet square. On this is built a brick pier bonded with blue stone every two feet, and on which the iron column rests, being keyed to an iron plate which rests upon the pier. The masonry is generally carried above ground.

Resting upon the masonry, the columns are carried up to the roof of the building, one directly over the other, forming thus, upon each pier, a single, long, slender pillar, composed of several sections of iron. The columns are cast with lugs by which they are bolted to each other, and with brackets on either side to receive the girders which run from one end of the building to the other. These columns are sometimes cast hollow and filled with brick or concrete which, it is claimed, gives them stiffness and adds to their fire-proof character. Messrs. J. B. & J. M. Cornell, of this city, have also a patent fire-proof column, which consists really of two columns, one within the other, which is hollow, and separated from the latter with plaster of Paris. The interior column supplies the strength, while the exterior is used for ornamentations, and the plaster makes the column fire-proof.

THE GIRDERS

generally extend from column to column from the front to the rear of the building. They rest directly upon the brackets formed upon the pillars and bear against the column itself, so that there is a continuous tie from the front to the rear of the structure. The beams which cross the buildings rest upon the girders and upon the exterior walls, and are frequently connected with each other at intervals by shorter beams, and receive the flooring which may be of cast iron plates or brick. The girders or beams themselves are of different forms. The principle of the beam is that the least amount of material should be used where the strain is the least and the greatest where the strain is the greatest, and where rupture tends to commence. Wrought iron is rolled into beams of various sections. Those kinds known as angle iron, T iron, I iron, bead iron, channel and deck iron are well known to our readers. The girders usually employed at the present time are of the I form. Girders formed of plates, or "riveted plate girders" as they are termed, generally take two forms, the single web or T girder, and the box girder. The latter seems to have the advantage of possessing a double web, offering more resistance to a direct strain, but experiments have shown that a better distribution of strength can be made in the single web girder. A box girder cannot be painted readily unless very large, and then only with great difficulty. In riveted plate girders, the danger of fracture is the greatest at the rivet holes. Lattice girders have an advantage where great depth is allowable, or long spans are to be bridged. They are lighter in appearance, and look well in situations where the girder is exposed to view.

Solid rolled beams and girders possess a great advantage over all others. They dispense with rivets and occupy but little space. Up to depths of 15 inches, they may be used to great advantage, but beyond this the cost of rolling increases more rapidly than the strength. A gang of workmen must attend to the rolling of each beam, special overhead machinery is necessary to pass them through the rolls, and they cannot be finished at one heat. It is also more difficult to squeeze the cinder from large masses, and the product is a less fibrous quality of iron. It is possible, also, to compound such beams, forming a powerful girder. A solid beam, however, was exhibited at the Paris Exhibition of 1867—3 feet in depth, and nearly 20 feet long. Another was 12 inches in depth and 106 feet in length. Arched girders strengthened by tension tie rods, are used in certain cases. The ordinary I beam is also compounded, two girders being laid beside each other to form a double girder. Pieces of cast iron are placed in the space between the beams at intervals, and the latter bolted together through this casting. The beams may be quadrupled or sextupled, by laying them in pairs over each other, and bonding them. Such beams are at present employed in the new N. Y. Post Office.

How England Resists Foreign Competition.—The following is published as an extract from a report lately made to the British Parliament: "The laboring classes generally in the manufacturing districts of the kingdom, and especially in the iron and coal districts, are very little aware of the extent to which they are often indebted for their being employed at all, to the immense losses which their employers voluntarily incur in bad times, in order to destroy foreign competition and to gain and keep possession of foreign markets. Authentic instances are well known of employers having in such times carried on their works at a loss amounting in the aggregate to £300,000 or £400,000 in the course of three or four years. If the efforts of those who encourage the combinations to restrict the amount of labor and to produce strikes were to be successful for any length of time, the great accumulations of capital could no longer be made which enable a few of the most wealthy capitalists to overwhelm all foreign competition in times of great depression, and thus to clear the way for the whole trade to step in when prices revive, and to carry a great business before foreign capital can again accumulate to such an extent as to be able to establish a competition in prices with any chance of success. The large capitals of this country are the great instruments of warfare against the competing capitals of foreign countries, and are the most essential instruments now remaining by which our manufacturing supremacy can be maintained; the other elements—cheap labor, abundance of raw materials, means of communication, and skilled labor—being rapidly in progress of being equalized."

The silver mines around Georgetown, Col., are wonderful in their numbers, magnitude and richness, but so refractory are many of the ores, that only a third or fourth of the silver is extracted by present processes. Large quantities of these ores are being shipped to England for smelting, and several smelting furnaces have been erected since 1870.

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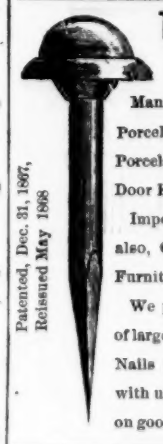

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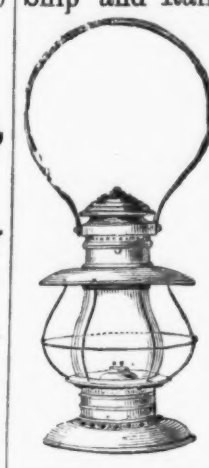

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The Heberlein Brake.

The improved railway brake, invented by Heberlein, is thus described by the London *Times:*

The system which is now being introduced into this country as perfected by its inventor, after several years of application to the subject, belongs to that class in which the brake power is obtained by rolling friction. To produce the desired result a drum of hard wood, laid with the grain radiating from the center, is fixed upon the axle of either the engine or the tender. Suspended by rods in a line with this drum, but a few inches distant from it, is a cast iron roller, having a wrought iron collar shrunk on it. Connected with this roller is a weighted lever, which when released causes the roller to press against the drum with a force due to the weight, and which can be regulated by moving it along the lever. From this lever a flat rod proceeds to the foot plate of the engine, where it notches into a rack and terminates in a handle. On the driver releasing the rod from the rack, the weighted lever brings the iron roller into frictional contact with the drum on the axle, which imparts a revolving motion to the roller. Upon the spindle which carries the roller are a pair of small pulleys, to each of which is attached a chain directly connected with the draw rods which actuate the brake blocks. The effect of the revolution of the roller is to wind these chains up on their pulleys, and so to draw the brake blocks into hugging contact with the wheels of the rolling stock. The brake blocks used are those known as hanging blocks, and as soon as the pressure is taken off they leave the wheels, regaining their normal position by gravity. The apparatus is released by the driver drawing in the sliding bar and notching it up to the required extent. By this system brakes can be worked from the foot plate of the engine, either on the engine or tender, or in any number of brake vans to which the apparatus is fitted that may be made up with the train. The apparatus can also be worked by the guard in the brake van, so that the train can be placed under the control of both driver and guard, as regards brake power. It is not necessary that the brake apparatus should be attached to the engine, as it works equally well when applied to the brake vans only, and the driver can as well as the guard still have command of the brake power, if desirable, or it may be wholly in charge of the guard. The brake is made continuous throughout the whole length of the train, the connection being formed by means of rods attached to the intervening carriages. The couplings are very simple, and an arrangement for connecting up with the carriages is placed at each end of the brake van, so that it matters not which way it is made up with the train, as it will act from either end. An important feature claimed for the Heberlein brake is that it is self-acting, so that if an axle breaks, or a carriage leaves the line, or, in fact, if anything occurs to bring a pressure on the brake connecting rods, the brakes at once act and retard the progress of the train. The apparatus appears to have made some progress on the Continent, where it was first brought out. Trains fitted with it are run on the Royal Bavarian State Railway and on the Zurich Railway; on the former line, indeed, it is now being generally adopted. Trains, it is said, are also being fitted with the Heberlein brake in Russia and Turkey. It has been partially tried in England, having been applied to a train working on the Broad street line for the last two months. The brake blocks on the carriages there, however, are those known as sliding blocks, and are not suited for the Heberlein system without the addition of an arrangement for taking off the blocks. This was at first done by means of a spring, but as that did not quite answer the purpose in practice, a weighted lever is now being applied. This promises to overcome the difficulty; for the successful working of the system is now interfered with by a defect in no way referable to the system itself.

New Patents.

We take from the records of the patent office at Washington the following specifications of certain patents lately issued, which will be found interesting:

IMPROVEMENT IN THE ARRANGEMENT OF METALLURGIC FURNACES SO AS TO USE THE WASTE HEAT UNDER STEAM BOILERS.

Specification forming part of Letters Patent No. 133,114, dated November 19, 1872; antedated November 13, 1872, issued to George Nimmo, of Jersey City, New Jersey:

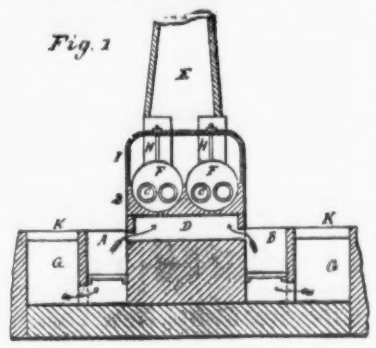
This invention relates to improvements in arranging boilers and furnaces in steel works so as to utilize the escape heat from the various furnaces wherein the steel is being melted, and using the said heat to make steam to drive suitable machinery to work the metal so made into merchantable shapes. To accomplish this, a number of furnaces are arranged side by side and in a line with the boiler, say, twelve in number (more or less), and having a boiler elevated so that the heat escaping from the furnaces shall pass underneath the boiler and along the botton to the end, thence through the flues into the chimney. This arrangement may be carried out by having one row of furnaces on each side of the boiler, or boilers, or a single row, as the case may be. The inventor prefers twelve furnaces in a row, so that six may be used alternately—that is to say, six one day and six the next, thus giving time for repairs.

Figure 1 is a vertical sectional side view of the boilers, furnaces and chimneys. Fig. 2 is a vertical sectional end view.

A, A, A, and B, B, B, Fig. 1, represent the furnaces. The arrows indicate the direction taken by the escape heated air and gases from the steel furnaces. C, the boiler flue; E, the chimney; I, I, are cast iron supports for the boilers; F, the boiler; H, the dome; I, supports to boiler resting on wall, 2, 2; E, the chimney.

Four pair of boilers may be connected with one chimney, thus radiating from the center of the chimney north, south, east and west, each boiler, or pair of boilers, having twenty-four furnaces—in all, ninety-six. The furnaces being used alternately—that is to say, every

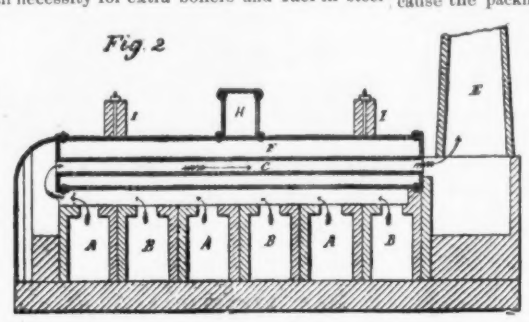
Fig. 1



IMPROVED FURNACE FOR USING WASTE HEAT.

other one—the heat would be distributed along the whole length of the boilers, returning through the flues to the chimney. In case too much steam is being made, suitable dampers may be arranged so that the heated air and gases will not pass through the flues, but will escape into the chimney direct. This configuration of boilers and furnaces will remove all necessity for extra boilers and fuel in steel

Fig. 2



works, as more steam will thus be made than can be used by all the machinery, hammers, rolls, &c., and without extra cost of fuel aside from that used in melting the steel.

Claim. The configuration of boilers and furnaces, arranged to operate substantially as described.

Specification forming part of Letters Patent No. 133,249, dated November 19, 1872, issued to John B. Pearse, of Swatara township, Dauphin county, Pa.

IMPROVEMENT IN APPARATUS FOR THE MANUFACTURE OF BESSEMER STEEL.

This invention relates to the apparatus for the manufacture of steel by the Bessemer or pneumatic process; and consists in an improved method of making the tuyere-box of the converting vessel and of inserting the tuyeres

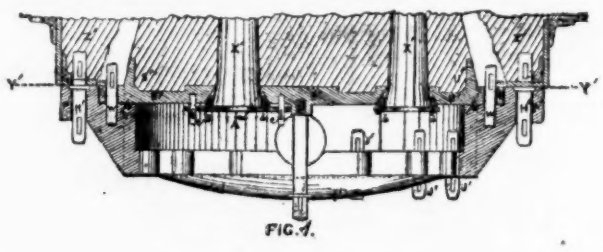


FIG. 4.

IMPROVED BESSEMER CONVERTER.

into the said tuyere-box. The tuyere-box is that part of the vessel furthest from the mouth or "nose" of the vessel. The blast, after passing through one of the trunnions of the vessel, goes into the tuyere-box and thence finds its way upward through the tuyeres into the melted iron in the body of the vessel. The tuyeres are usually inserted into holes in the top of the tuyere-box, and are held in place by screw-brackets; any space remaining around their base when in the holes is packed with hemp forced into said remaining space and into

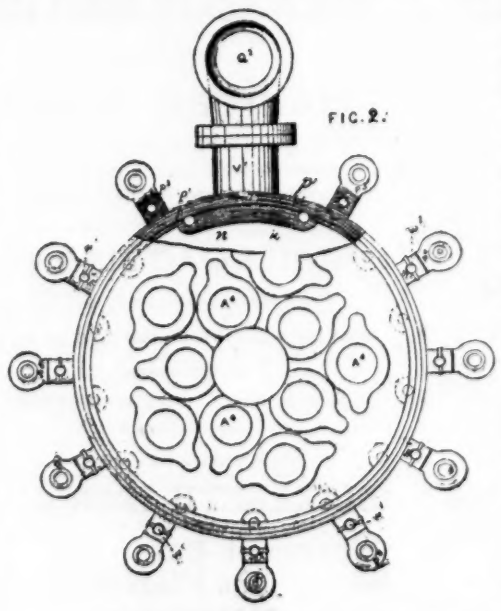


FIG. 2.

grooves left for the purpose. The tuyeres usually pass through a second plate, which is so fixed upon the top of the tuyere-box as to leave some space through which the air can get away in case any escapes through the packing around the tuyere. This plate is held firmly and permanently in position by a sufficient number of screw-bolts, and the tuyeres simply pass through it loosely. The so-called "bottom" is the ganister (a mixture of quartz and fire-clay in various proportions) which is rammed in a conical shape upon the tuyere-box, or, as the case may be, upon the second plate. With all previous arrangements of the tuyere-box and methods of ramming the ganister-bottom upon the same, except that patented by Holley & Pearse in patent No. 86,304, the tuyere-box has been cast in one piece, as a whole, and, therefore, much unnecessary weight has to be handled in the operations subsequent to the taking of the tuyere-box off the vessel for the purpose of renewing the bottom. In some cases even a part of the lower section of the vessel is taken off along with the tuyere-box and is retained in connection with the latter. Both these methods are very cumbersome, and, in addition to the unnecessary handling of very heavy and unwieldly weights, the large size of the pipes thus required to be taken off makes it necessary to take up a great deal of otherwise useful space in the drying ovens, and also on the floor of the converting-room. In Holley & Pearse's patent the separate plate holding the tuyeres and forming the top of the tuyere-box is inserted upward and inside the tuyere-box; but this joint between the separate plate and the flange round the top of the tuyere-box has been found to be very imperfect owing to the difficulty of making it tight against the blast without using such contrivances as greatly hinder, if not prevent, the removal of the separate plate after the bottom has been worn out. The old method of packing the joints round the tuyeres with hemp (or hemp smeared with fire-clay) forced into grooves is unreliable, because the packing can never be firmly forced into the grooves left for the purpose. The leakage of the blast up around the tuyeres has heretofore been, and is still, where the old method is used, a source of great trouble and expense.

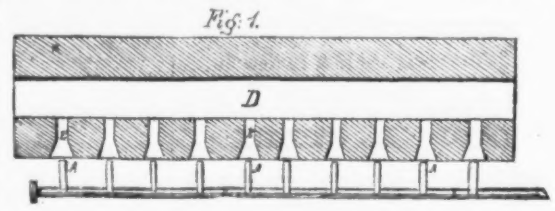
The invention consists in so arranging a separate top plate of the tuyere-box that it can be keyed on the top of the body of the tuyere-box from without instead of from within whenever a fresh bottom is to be inserted into the vessel, and so that it can be quickly removed from the tuyere-box and lifted off whenever a bottom has been used up. It also consists in the combination, with this removable top plate, of an improved method of packing the tuyeres in the same so as to secure a perfectly air-tight joint.

Fig. 1 is a representation of improved form of tuyere-box as attached to the vessel. The lower section of the vessel comes down to the line Y′ Y′. The removable separate plate which is keyed upon the body of the tuyere-box is represented by the letters B^1 B^1. Through this removable plate the tuyeres X^1 X^1 run, being placed and packed in the holes A^2, (shown as partly filled by the tuyeres X^1.) This removable top plate is turned up smooth and true for a space of about three to four inches wide on the outer part of its lower side, and is held firmly down against the part *p* of the body of the tuyere-box, which is turned off smooth to receive it, in order that no wind may escape there. Keys driven through the holes in the pins W W, which pass through the small lugs *m m* of the removable plate or top, hold the latter firmly down in its place against the pressure of the wind inside. The under side of the small lugs *m m* is also faced off smooth and true. The tuyeres X^1 X^1 are shown in the holes A^2 in the removable top plate, and the method of packing the tuyeres in the holes is clearly shown. The gland or circular wedge, in the form of a ring tapering to an edge, is marked *b b*, and keys driven through the studs *c c* drive the glands firmly up into their places.

Fig. 2 is a representation of the tuyere-box with the removable plate in position. Part of the latter is broken away in order to show the method of making the joint between the body of the tuyere-box and the removable plate. The lugs on the body of the tuyere-box are shown by the letters P^3. The studs H′ H′, Fig 1, which hold the tuyere-box on the vessel, pass through the holes O′ O′. The lugs of the removable top plate are denoted by the letters m^1 m^2, and the studs which pass through them are marked W′ W′. The holes for the tuyerer are marked A^4 A^4. The joint or faced part of the body of the tuyere-box, on to which the faced part of the removable top plate fits, is shown by the moderately-dark-ened surface marked *p′ p′*. The very dark part marked *n n* is at the bottom of the tuyere-box, and is a part of the flange through which the studs J′ J′, Fig. 1 (which hold the wrought-iron plate I′ I′), pass, by means of the holes L′ L′. V′ represents the blast-pipe leading to the tuyere-box, and Q^2 the bell-mouthed opening of said pipe.

After the ganister-bottom has, in the course of using the vessel, been worn down so as to be too thin to stand the heat and wear of another conversion, it must be removed and another and fresh bottom substituted, as follows: When the tuyere-box is to be removed from the vessel, take the keys out of the pins H H, Fig. 1; let the whole tuyere-box, with its top plate B^1 B^1, together with what is left of the tuyeres and ganister-bottom, down upon a car placed under it. Then shove the car into such a position that it can be conveniently got at with a crane, and remove the keys from the studs W. This leaves the top plate entirely free from the body of the tuyere-box, and it is then lifted off from the latter, which is left on the car. Then put a fresh bottom, which has been previously rammed and dried on another removable top plate B^1 B^1, upon the body of the tuyere-box which has remained on the car. Then key the removable top plate fast to the tuyere-box by means of keys driven through the studs W W. This makes a perfectly tight joint against any blast used in the tuyere-box. The bottom and tuyere-box are then ready for use, and the car is shoved back again under the vessel. The tuyere-box and bottom are then raised into position on the vessel, as shown in Fig. 1, and the whole is keyed fast by means of keys driven through the pins H′ H′. The bottom is then ready for use as soon as the lining of the vessel Z′ Z′, has been repaired at the joint between it and the bottom.

Fig. 1.



IMPROVED HEATING FURNACE.

The method of inserting the tuyeres into the removable top plate of the tuyere-box is as follows: First, put the tuyere X^2 on and into a gland and then insert the tuyere into the proper hole (which is that shown at A^4, Fig. 2), in the removable top plate B^1 B^1, Fig. 1. Then, as the tuyere goes up, the gland comes into contact with one of the sides of the hole, and instantly centers itself and the tuyere, holding the latter firmly, when the gland is keyed up. Then ram ganister-bottom around the tuyeres and dry it in an oven.

After the bottom is dried and taken out of oven, pack the tuyeres as follows: First remove the glands, as the friction of the ganister against the tuyere retains the latter in its place. Then fill all the space between the tuyere and walls of the hole with any clayey mixture that will set hard, but preferably with a mixture of brick-clay and anthracite-coal dust, mixed to the consistency of putty. Then drive the gland forcibly upon and into this clay putty, so that the latter is forced into every crack between the tuyere and the walls of the hole, and between the removable top plate and the gland. When this clay putty has been warmed by the heat of the vessel it does not shrink, but sets as hard as a brick, thus forming a perfectly air-tight joint (which is indestructible by heat) between the tuyere and the removable top plate.

This improvement facilitates handling by reducing the weight and size of the parts to be handled, and by putting the parts into better shape facilitates all operations performed on the bottom. It renders the repair of the tuyere-box perfectly easy, and makes the expense of such repair merely nominal. In drying the ganister-bottom in an oven on the old plan, the whole tuyere-box, blast-pipe, &c., must be lifted and handled with the bottom. If the blast leaks up around a tuyere in the old tuyere-box, and the steel, in consequence, burns the top plate, the whole expensive tuyere-box is often made useless. If this accident occurred with this improvement, the necessary repair would merely be to put a fresh top plate on the tuyere-box. The cost of the removable top plate is merely nominal. Further, the top plate is scarcely liable to be burned where this improvement is used, because this method of packing the tuyeres becomes a reliable joint.

Claim.—1. The combination, with a tuyere-box as ordinarily constructed, of a removable top plate, intended to be taken off whenever the ganister-bottom has been worn out by use, and so constructed as to be laid upon the tuyere-box from above, as specified.

2. The combination, with a tuyere-box as ordinarily constructed, of a removable top plate, intended to be taken off whenever the ganister-bottom has been worn out by use.

3. The combination, with a removable top plate, of a circular flange, either cast in one piece with it or cast on the second plate, which is sometimes used with the removable top plate.

4. The combination, with the removable top plate, of a number of glands, each formed by a sharp-edged annular ring and a flange, substantially as and for the purposes described.

5. The glands of the shape as described, so that they will hold the tuyeres firmly in place while the ganister-bottom is being rammed around them, substantially as described.

IMPROVEMENT IN FURNACES FOR HEATING CRUCIBLES, METALS, &C.

Specification forming part of Letters Patent No. 133,538, dated December 3, 1872, issued to Benjamin A. Mason, of New York.

This invention consists in an improvement in apparatus for and method of heating and annealing of metals, for the purpose of reducing and manufacturing the same.

Figure 1 is a longitudinal sectional view of the furnace. Fig. 2 is a transverse section.

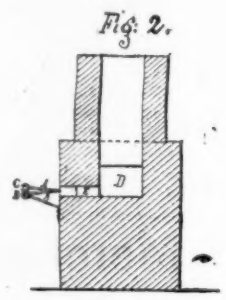
The same letters indicate like parts in the drawing.

Gas, carbureted or otherwise, is used to heat the furnace, which is burned in the following manner: a series of pipes, A, project laterally from two or more pipes placed longitudinally with the furnace. The longitudinal pipes B and C, are placed one above or by the side of the other, generally about six inches from the exterior walls of the furnace. From the pipes B and C a series of short lateral pipes, A, project inward toward the chamber of the furnace D, through the spaces or openings E, the pipes, however, not entering the angular or flaring space at the entrance of the openings, but reaching to within a short distance of the same. The pipes B and A carry the volume of gas, while a blast of air passes through the pipes C and A, and mingling with the ignited gas at the mouth of the pipes B and A, drives the burning gas through the openings E into the chamber of the furnace, where it is consumed, maintaining an intense heat, free from sulphur and other deleterious matter so often found to injure metals when present, as in ordinary fuel under combustion.

Since the various burning jets of gas from the main pipe B are readily controlled and adjusted, and the force of the air-blasts from the pipe C is with equal facility regulated, the heat can be applied with any desired power in any or all parts of the furnace, and be varied at pleasure, to suit the various circumstances of each case or occasion. Hence not only intense heat is produced, but such as can be controlled in degree to any extent. The outside open jets of the burner tubes A A, in addition to their forcing outside air into the furnace to assist the combustion, also enable the force of the flames to be seen at all times from the outside, so as to regulate them the more easily and precisely.

1. A series of lateral burner and blast pipes or tubes, A A, projecting from gas and air blast feeding pipes B C, in combination with a furnace or furnaces, D, provided with openings E E, to receive the respective jets of gas and air.

Fig. 2.



2. The arrangement of the lateral burner and blast pipes A A, outside of and disconnected from the furnace D, and opposite to the openings E E thereof.

3. The openings E E, having the angular or flaring form, as described.

Lake Superior Iron Ore.

The Portage Lake *Mining Gazette* says: If we take facts, figures and developments as they are presented to us from time to time, as an index of what the future will bring forth, and apply such facts and figures to an estimate concerning the future, the Lake Superior Iron Region could claim the palm as the leading and governing business district of the United States.

Ten years ago this locality commenced feeling its way into the world. At that time it had the old iron mines of Pennsylvania, New Jersey and New York to contend with as competitors. The product of the mines of these States was not sufficient to compete successfully with English producers of pig metal. The ores of these old mines were lean. Lake Superior ores proved rich, almost to the fullest extent allowed or expected of iron ore. Hence they were in demand. But how to get them to market was the question. Without sufficient railroad or dock facilities, and a thousand miles of water navigation to encounter, the problem of developing the vast deposits of iron ore which were known to exist in this region, seemed one of extreme uncertainty, and especially the chance of developing it to anything like an extent which would compare with the total products of all other iron districts.

But behold the results. It is now less than two decades since the first shipments were made, in competition with all the other iron ore regions in the country. But notwithstanding there were no railroads, but an indifferent force of marine, and the mines were entirely remote from the furnaces, we find to-day that transportation facilities were created, and the district is now furnishing two-thirds of all the iron ore consumed in the United States. We find that out of 350 furnaces, which are of standard character, between the Atlantic and the Mississippi, and between the lake country and central Kentucky and Virginia, from 125 to 140 of these furnaces are using Lake Superior ore exclusively, except so far as they find it advisable to use local ores for mixture, while a much larger proportion of furnaces are using a large per cent. of them from necessity.

As we said at the beginning of this article, if the past can be taken as an index of the future, it will be safe to calculate that before another decade this district will be supplying at least one-half of all the ore used in the United States.

Our people seem to anticipate this fact. They are extending railroads, increasing the number and capacity of their mines, and engaging in the construction of marine craft for the transportation of ore, as if they were guaranteed that the results to which we allude were certain to be realized.

Let us hope that no disturbing influence will step in to interfere with this prospect. All who have studied the nature and tendencies of the spirit of the age, are satisfied that iron will assume a more important position in the future than it has occupied in the past; and while both the demands of the times and the convictions of economists point to such a result, we, who are devoted to this interest, have but to push forward earnestly to have every anticipation realized.

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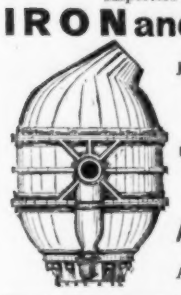
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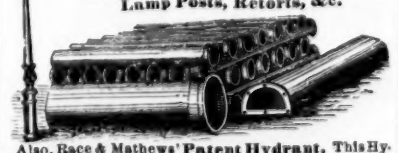
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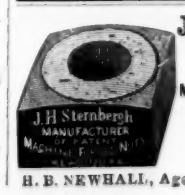

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OUR IRON INDUSTRIES.

Notes of Progress in Various Parts of the Country.

In our issue of November 21st, we published some interesting notes showing the condition and progress of the iron industries of different sections of the country, gathered with care from private sources of information. Below we give a continuation of these notes, which will be read with interest:

IRON MOUNTAIN AND THE IRON ORE OF MISSOURI.

About 80 miles south of St. Louis, and 40 miles west of the Mississippi River, being very nearly the geographical center of the great Mississippi basin, is to be found one of the most remarkable iron formations in the world—a mountain of solid iron ore. Iron Mountain is a flattened, conical shaped hill, rising about 230 feet above the valley, or 800 feet above St. Louis, the base covering about 500 acres. The surface was originally covered with weather worn pebbles and masses of a larger size of dark ore, from which it obtained the name of black hill among the old hunters. The larger masses, some of which were six to eight feet in diameter, have been picked off, but wherever the surface has not been disturbed by miners, the smaller pebbles still remain covering the ground. Mixed with a reddish clay, they cover the surface of the mountain to the depth of from one to thirty feet, and constitute what is known as surface ore, which is separated from the clay by screening. No perceptible difference in quality or per cent. of iron exists between this and the bluff, or solid masses of ore beneath. The main central ledge of this bluff ore runs nearly east and west, ranging from 40 to 200 ft. wide, and toward which all the seams dip. It is mined by blasting; nowhere is there any rock found. As an indication of what remains to be developed after the hill has been removed, which, by careful measurement, contains over one-and-a-half millions cubic feet, some time ago an attempt was made to bore an artesian well near the base of the mountain, the result of which showed 16 ft. surface ore and clay, followed by 34 ft. of sandstone. At a depth of 89 ft. a bed of pure ore five feet thick was found, followed by 7 ft. of porphyritic rock. At 112 ft. pure ore was again found and continued for 50 ft., where the boring stopped.

The Iron Mountain Company is emphatically a "close corporation," the whole of the stock, the amount of which is a secret, being owned by three families. The company was organized in 1845, yet but little was done beyond surface picking until 1864, when the first shipments were made. Not until the past year, however, has the mountain been thoroughly worked. It is estimated by those who have been with the company since its organization that 1,000,000 tons of ore have already been taken from the mountain, one-fourth of which, or 250,000 tons, were mined and shipped the past year (1872). Numerous miniature railroads connect every part of the mountain with a side track of the Iron Mountain Railroad, and, but for the bad condition and incompetent management of the line, the company would be able to ship 150 car loads per day, of 10 tons to the car. The actual shipments have been considerably short of this, or as previously stated, about 250,000 tons for the year. Beside supplying nearly all the ore for the furnaces at Carondelet, St. Louis, large shipments of ore are made to Ohio, Indiana, and as far east as Pittsburgh, Pa.

In the work of mining more than 800 men are employed, who earn from $1·50 to $1·75 per day, beside nearly 100 boys, earning from 65 cents to $1·25 per day. There are also about 125 men employed at the furnaces and 60 on the farm. There are two 22-ton charcoal furnaces, built at the end of a ridge that runs out from the mountain some 200 yards, that have been in operation for the past twenty years. The ore to supply these furnaces has been, until quite recently, supplied from open cuts made in the end of this ridge. The yield the past year was about 13,000 tons of an excellent quality of hot blast charcoal pig, 160 bushels coal being required to produce one ton of iron of 2268 pounds. The ore works about 68 per cent. iron at the company's furnaces, or 70 per cent. at those at Carondelet. The company owns over 30,000 acres, 18,000 of which is an old Spanish grant; 1500 acres is under cultivation, the entire products of which are consumed by the employes and stock of the company. The whole work is under the immediate supervision of Mr. Auburchon and his two sons.

The immense value of this part of Missouri is only beginning to be appreciated even by those most directly connected with its development. Beside Iron Mountain the only mines that are being worked to any considerable extent are at Pilot Knob, about five miles south of Iron Mountain. The Pilot Knob Co. has seven mountains that have been prospected, and show ore in quantities that will pay working. They have two hot blast charcoal furnaces that yields 20 tons pig per day; the shipments of ore will amount to 100 tons per day. The Pilot Knob ore is harder and finer grained than that of Iron Mountain, so much so that it makes good whetstones. It is necessary to roast it before smelting. The top of the mountain is covered with a layer of slate about 40 ft. thick, below which is a layer of good ore 30 to 40 ft. thick, yielding from 50 per cent. to 65 per cent. iron, the stratum dipping nearly west at an angle of 25 or 30 degrees. Below this no prospecting has been done. The reputation of Knob ore has suffered seriously in the past for want of care in separating it from the slaty rocks above mentioned. It seems with proper care an ore may be obtained almost as rich as Iron Mountain, but at greater cost. The company employs altogether from 350 to 400 men, 150 of whom are on the Knob.

From the summit of Pilot Knob, the highest point within a radius of 200 miles, the visitor commands one of the finest views of the interior of the continent. At his feet is the noted valley of Arcadia; a mile to the west is an oblong mountain of almost equal hight with the Knob, that contains some fine specimens of magnetic ore, at the foot of which lies the village of Ironton; to the right is the little village of Pilot Knob, and, just beyond, Cedar Hill, the mines of which are just being opened by the Pilot Knob Co.; while farther in every direction mountains of less size raise their conic-shaped heads, beneath which lie more than 5,000,000 acres of mineral fields. The Iron Mountain road and its branches pass over 200 miles of these fields, and the Atlantic and Pacific 50 miles more. New roads are being projected every year and rapidly put into operation. A road from Iron Mountain direct to the Mississippi River will be completed the coming summer, thus reducing the distance to water transportation one half, and furnishing facilities for shipping all the ore that may be desired.

There are eight charcoal furnaces in the State that made last year 55,000 tons of pig iron; also four hot blast stone coal furnaces that made about 90,000 tons pig. These are all situated at Carondelet, just below St. Louis, on the line of the Iron Mountain road, and the bank of the Mississippi, of which the Vulcan Iron Works—two furnaces—are the largest. They are all new except the old Carondelet furnace, the Vulcan having been in operation only a little more than a year. Connected with these furnaces is a large rail mill containing 40 puddling furnaces and 15 heaters, 10 in. rail mill and 5 in. top and bottom mill, the whole establishment employing about 650 men. The two blast furnaces will yield about 80 tons pig per day, the product of one being worked into rails, while the other is used for making steel ingots, mostly for the Chicago Steel Works. The blast engine is 47 ft. high, steam cylinders 5 ft. diameter and 9 ft. stroke, and the blowing cylinders 9 ft. diameter and 9 ft. stroke. They blow for the two furnaces 14,000 ft. of air per minute, at 12 revolutions. The bed plate of the engine weighs 44,000 lbs., and is probably the largest engine in the West. It was made by Totten & Co., of Pittsburgh. A third blast furnace will be completed here during the present month, with a 16 ft. bosh, stack 63 ft. high. The hot blast has 84 pipes of the largest size, while the walls are about 50 per cent. thicker than are usually built, for the purpose of making Bessemer pig. It will run 55 tons per day.

Just above the Vulcan Works, and on the site of the old Union Iron Works, where Capt. Eads launched so many gunboats during the war, Messrs. Garrisons, Choteau and Hart are building a furnace which, when completed, will be the largest in the West. It will have a 20 ft. bosh, with stack 75 ft. high. There will be two hot ovens for each furnace, each 19x31. It is intended to have one furnace done by the 1st of May, which will yield 85 tons pig iron per day. As soon as this is completed, the second will be commenced.

CHARCOAL IRON IN MARYLAND.

Beyond those directly connected with the manufacture or use of car wheel iron, it is probably not generally known that the State of Maryland, and particularly Baltimore and vicinity, produces some of the very best charcoal pig iron in the country, and in such quantities that Baltimore may be considered the principal market for charcoal pig. Orders are received from all parts of the country, as far West as St. Louis. This may appear very much like carrying coals to Newcastle, but it only illustrates the fact that the varieties and uses of iron are as great as those of almost any other commodity, and that the very best iron for one purpose may be quite useless for another. There are eleven charcoal furnaces in the State that produced during the past year about 34,500 tons pig iron, viz.:

Stickney Iron Co	Tons 3,100
Chesapeake	" 2,600
Cedar Point	" 2,500
Maryland (two furnaces)	" 5,000
Laurel	" 2,000
Locust Grove	" 1,000
Muirkirk	" 2,000
Harford	" 1,300
Catoctin (two furnaces)	" 5,000

It will be seen the Stickney Iron Co.'s furnace manufacture the largest amount. The oldest now in operation is the Catoctin furnace, originally built in 1774, but rebuilt at its present site in 1787. Messrs. Reed, Stickney & Co. show pigs bearing date of manufacture as old as 1751, but the first production of iron in Maryland dates considerably back of this. Iron was exported from this State to England in 1717, but at that time nothing more than pig was allowed to be made. Afterward (about 1737), the colonists were graciously permitted to make bar iron, the act providing, however, that they should build no "rolling mills, slitting mills, or forges for making plates, as that would interfere with the manufactures of Great Britain." Among the novel reasons for this restriction, was one advanced by the tanners of Sheffield, who petitioned the British Parliament not to remove the duty, as by reducing the amount of British manufacture, a panic would be produced in the bark trade, charcoal being the only fuel used for smelting in that day. In 1756 there were eight furnace and nine forges in the State.

Along the lines of the P. W. and B., and the Washington Branch of the B. and O. railroads for a distance of about 50 miles, there is a bed of ore six to eight miles wide, and in places 50 ft. deep. This is a carbonate of iron running from 32 to 40 per cent. from the furnace, and existing in flattened nodules, which are peculiar to Maryland, imbedded in clay, in weight from a few pounds to 100 pounds or more. From its color it is known here as home and chocolate ore. This bed underlies the city of Baltimore, mining now being carried on to a limited extent within the city. One of the largest deposits is found near Fort McHenry. While there is no reason to anticipate a falling off in quantity, the ore is probably not sufficiently abundant to justify more active work. There has been no increase in the amount manufactured during the past 15 years.

In addition to the above, the Ashland Furnace Company manufactured during the past year about 17,000 tons anthracite pig iron.

The Abbott Iron Company has made during the past year about 5000 tons plate iron. They have recently added a train of three high rolls to the plate mills, which they claim to be the largest chill rolls in use in this country. They were manufactured by Messrs. Garretson & Co., of Pittsburgh. They are able to roll plates 100 inches wide and girders 40 ft. long. Their rail mills have a capacity of 40,000 tons per year, and they anticipate a lively business in this department the coming season. Beside the above there is one other small plate mill owned by Coates & Bro., and a bar iron mill run by Trego, Thompson & Co.

Steam Traction Engines.

We take from advanced sheets of the *Journal of the Franklin Institute*, the following abstract from Professor R. H. Thurston's interesting paper on "Traction Engines, or Road Locomotives," lately read before the Polytechnic Club of the American Institute:

1. A traction engine may be so constructed as to be capable of being easily and rapidly manœuvered on the common road and in the midst of any ordinary obstructions.

2. Such an engine may be placed in the hands of the average mechanic with confidence that he will quickly acquire, under instruction, the requisite knowledge and skill in its preservation and management.

3. An engine weighing rather more than five tons may be turned continuously in a circle of 18 feet radius without difficulty and without slipping either driving wheel, even on rough ground, and may be turned in a roadway of a width but slightly greater than the length of the locomotive, by proper manœuvering.

4. A road locomotive, weighing five tons, four cwts., has been constructed, which is capable of drawing, on a good road, more than 23,000 pounds up the almost unexampled grade of 533 feet to the mile, at the rate of four miles an hour.

5. Such a locomotive may be made, under similar conditions, to draw a load of more than 63,000 pounds up a hill rising 225 feet to the mile, at the rate of two miles per hour, doing the work of more than 20 horses.

6. The action of the traction engine upon the road is beneficial, even when exerting its maximum power, while, with horses, the injury to the road bed is very noticeable.

7. The coefficient of traction is, with such heavily laden and roughly made wagons as were used at South Orange, and under the circumstances noted, not far from four per centum on a well made macadamized road.

8. The amount of fuel, of good quality, used may be reckoned at less than 500 pounds per day, where the engine is a considerable portion of the time heavily loaded, and, during the remaining time, running light. It may be considered, without probability of serious error, that, during the trials at South Orange, engine No. 2 performed pretty nearly an average day's work.

DEDUCTIONS.—A number of interesting problems may be solved by reference to the facts learned here. A comparison of the efficiency of the road steam traction engine with that of horse-power, in drawing heavy loads, is especially important, and we will now make such a comparison, basing it upon the most reliable data at hand.

TRACTION FORCE.—It has already been stated that engine No. 2 (Aveling & Porter's make), developed a tractive force equal to that of 20 horses.

The actual tractive force may be determined as follows: The coefficient of traction was, as has been shown, not far from 0·0427, which is also very nearly the maximum figure given by General Morin, as determined by his experiments with "dray carts" and "chariot-porte-corps d'artillerie," upon metalled roads and upon roads paved with sandstone. This coefficient is large, partly in consequence of the very slight breadth of the wheel tires and the small diameter of the wheels the wagons used, and partly because the wagon bodies were not mounted on springs. To be absolutely certain that no error is committed by over estimation in the following calculation, this co-efficient will be taken at 0·03. The actual tractive force required to overcome the rolling resistance was, then, $63{,}400 \times 0{\cdot}03 = 1902$ lbs. The force required to overcome that component of the force of gravity which directly resisted the motion of the load in this case, where the road laid at an angle with the horizontal, whose tangent was 0·0427, was $W \sin \theta = 2700$ pounds; the total resistance was therefore 4602 pounds. Including the weight of the traction engine itself, these figures become 2251 and 3·002 pounds, giving a total of 5253 pounds direct resistance, and a co-efficient of adherance of $5253 \div 18{,}348 = 0{\cdot}28$, which slightly exceeds that found on earlier trials of smooth wheels.

Experiments made by Capt. Robt. Merry, at the Jackson Iron Mine, Negaunee, Mich., and the observations and experiments of the writer, indicate the maximum direct tractive force of a good horse to be about 250 pounds. This corroborates the estimate already made, making the tractive power of this engine equal to that of twenty horses.

Deducing from the above the weight which could be drawn, on an equally excellent but level road, by this locomotive, the co-efficient of traction being the same, we find it equal to $\frac{5253}{0{\cdot}03} = 175{,}100$ pounds, or very nearly eighty gross tons, and "excluding the weight of the locomotive" (163,452), seventy-five tons. With the machine, as with the animal, it would not be expected that, in regular work, on ordinary roads, more than one-half of the maximum power would be exacted, although, with such a reserve, the machine possesses a decided advantage over the animal.

Working Time.—The working time of a horse is usually considered to be eight hours per day for dray horses, and less for carriage horses. The dray horse which is kept in harness eight hours per day, is usually standing unworked a considerable portion of this time while his load is handled, and also during one-half, usually, of the remaining time his vehicle is drawn unloaded. The horses of the Third avenue street railroad, in New York City, are worked less than six hours per day, and are given one day in seven as a day of rest. This is about equal to the working time of horses and cattle crossing our Western plains with moderate loads.

The steam engine requires no such careful limitation of working time. It can work twenty-four hours uninterruptedly as readily as a single hour. Ten hours a day would be, in most cases, made the daily working time of a road locomotive, the period being determined by the proper length of the working day of the driver, rather than by the capabilities of the machine.

The working time of the traction engine may therefore be stated to be, ordinarily, twenty per centum greater than that of the dray horse, and to be capable of indefinite extension when required.

The loss of working time by the horse through illness, at the farriery, &c., and that lost by the locomotive in the repair shop, are proper subjects for comparison, but it is difficult to determine them in the absence of reliable data. We may estimate these losses as equally affecting the two motors, with a probability that the correction of any error in such estimate may make a change favorable to the locomotive.

First Cost.—Comparing the first cost and running expenses of steam and of horse-power, we may work from tolerably well established data. The list price of the Aveling & Porter road locomotive is, delivered in New York, about $4000.

The average cost of horses purchased by the Third avenue railroad, in New York city, is now $157·50, and it would require more than twenty such horses to pull the load of a traction engine, while an addition of twenty-five per cent. must be made for the greater length of the working day of the locomotive. Twenty-five such horses would have a first cost of $3,937·50, to which must be added the large item of cost of harness. The first cost of steam and of horse power is, therefore, nearly equal, the difference being in favor of steam, leaving, also, on the side of the engine, the immense advantage arising from its ability to work longer hours when required, and indefinitely. The interests on these first costs also nearly balance each other.

Running Expenses.—The running expenses of the locomotive consist of cost of attendance, of fuel, oil and repairs, and of depreciation in value with use; those of horse-power are attendance, food, stabling, sickness and depreciation with age. The cost of attendance upon the one engine and the twenty-five horses may be taken at $939 and $3130, respectively, assuming each driver of the latter to be able to manage a six-horse team. The engine driver receives three dollars per day and the other men two dollars and a half, and there are 313 working days in the year.

The cost of fuel, oil, and incidentals, excluding repairs of the engine and its depreciation, may be averaged at $900 per year, in the vicinity of New York. This is somewhat higher than the cost of similar items on railway locomotives in New York State.

The cost of repairs and depreciation has been thus far so small at South Orange that it could not be estimated, but for the life of the engine, it will be likely to average something less than fifteen per cent. of the first cost, or, in this case, $600 per annum. This we arrive at by an examination of railroad locomotive expenses, as officially reported.

The total annual expense, therefore, of the traction engine referred to may be reckoned at $2439 as a maximum figure, including cost of attendance. A similar estimate will give, for the annual expense of keeping one horse, very exactly $300, excluding attendance. In the year 1870, 10,315 horses in the State of New York, cost for stabling, feeding, repairs to harness and shoes, etc., according to the official statements, $3,182,838·24, or $308·56 each animal. From this is to be deducted about eight dollars per head for receipts from sales of horses, leaving for annual expenses, say, $300 per horse. The expense account, excluding attendance, would be, for twenty-five horses, $7500, as against $1500 for a similar amount of steam power, and, including attendance, $10,500, as against $2439.

The total annual cost of horse-power, for comparison, 25x$209·43—$5235·75, to which we add $3130 for drivers, and we make a total cost per year of $8365·75, to be compared with $2439, the total annual expense of the road locomotive capable of doing an equal amount of work. The expense account when doing heavy work on the common road, under the described conditions, by steam-power, is therefore less than 25 per centum of the average cost of horse-power, as deduced from the total expense of such power in New York State; while if we take for comparison the lowest estimate that we can find data for in our whole country, we still find the cost of steam-power to be but 29 per centum of the expense of horses. We may state the fact in another way; a steam traction engine, capable of doing the work of 25 horses, may be purchased and worked at as little expense as a team of six or eight horses.

Prospective.—It was formerly supposed that success in the transportation of passengers by steam on post routes would lead to the application of that motor to the movement of heavy loads and to agricultural purposes generally. When, after so long a trial, the experiment finally seemed to have failed of success, it was believed that steam could not be applied to heavier work on common roads. As we have now seen, however, it appears probable that the inventors of that day attacked the problem at the wrong point, and that, on the common road, the transportation of heavy loads by steam being accomplished with economical success, under ordinarily favorable circumstances, it may prove introductory to the use of steam in carrying passengers and light freight at higher velocities.

One of the most important of the pre-requisites to ultimate success in the substitution of steam for animal power on the highway is that our road shall be well made. As the greatest care and judgment are exercised, and an immense outlay of capital is considered justifiable, in securing easy grades and a smooth track on our railroad routes, we may readily believe that similar precaution and outlay will be found advisable in adapting the common road to the road locomotive. It is undeniably the fact that, even when relying upon horse-power, far less attention has been paid to the improvement of our roads than true economy would dictate. With steam-power, the gain by careful grading and excellence of construction of the road-bed become more important. The animal mechanism is less affected in its power of drawing heavy loads than is the machine. With the horse, a bad road impedes transportation principally by resisting the movement of the load rather than of the animal, while with the traction engine the motor is as seriously retarded as the train which follows it, and frequently much more, on soft ground.

Steam, therefore, cannot be expected to attain its full measure of success on rough and ill-made roads; but where highways are as intelligently engineered and thoroughly well-built, or where nature has relieved the engineer and the road-builder of the expensive work of grading, as throughout a very large extent of the Western and Southern portion of our country, we may expect to see the road locomotive rapidly introduced.

The Gyro Pigeon.—Mr. Bergh, as President of the Society for the Prevention of Cruelty to Animals, in his late annual statement, has called particular attention to the brutal character of pigeon matches, but action of a repressive character on the part of the society has been suspended—the only steps taken having been to detail officers to attend on such occasions, and to see that mutilated birds were speedily destroyed. In the United States of late years pigeon matches have been quite in vogue, and considerable prominence has been given to shooting contests of this character. Jerome Park has on many a day resounded with the reports of fowling-pieces, and residents in the neighborhood have felt some distress at finding on their lawns innumerable birds with feet or bills shot off. The new gyro pigeon, or trap, an English invention, appears in the sporting world as a fitting substitute for the unfortunate pigeon. As exhibited to-day, the invention seems a perfectly practicable one. The "bird" consists of a piece of steel, as nearly as possible the size of a pigeon, with extended wings, looking something like a screw propeller, which, by a coiled spring, is thrown into the air, and on the principle of the Archimedean screw is, by the resistance of the air, made to fly through space. It can, by means of a stand worked in a ball and socket joint, be made to take any direction at the start, but once launched, its flight is quite as erratic as that of the most capricious "blue rock." The bird itself is painted white or black, according to the fancy of the sportsman, and when shot at and struck, the leaden pellets leave their mark on the metal. This gives the crack shot an opportunity to tell to a nicety how many shots he has sent into the flying mark. It allows even a system of handicapping, both simple and satisfactory. Under the direction of Mr. Bergh, a thorough trial of the steel pigeon will be made, and as it has met with great success already in England and the United States, we have every reason to suppose, that for the future, pigeons will have a better chance for life.

American Locomotives in Russia.—The *Russian News* reports the experiments made between St. Petersburg and Laubane, November 25, with a Baldwin locomotive made to burn anthracite coal. With a train of ten cars it passed over the heaviest grades at the rate of 60 versts (10 miles) an hour, and burned in running 130 versts (86 miles) 62 poods (2232 pounds) of anthracite. These engines, it is believed, will be of great service in the south of Russia, where there are unworked mines of anthracite and very little wood, but where heretofore wood has been burned. *La Bourse*, of St. Petersburg, also reports the trial, and describes the construction as follows: "The frame is solid instead of being of plates, the construction of the cylinders, the manner in which they are adapted to the machine, and the mechanism of all the details which enter into the construction of a locomotive excel anything of the kind ever seen. But the most striking feature is the immense fire box, about 9 feet long, which forms the essential part of the system of heating with anthracite. Grates formed of several ranges of tubes, one above the other, extend from front to rear in the furnaces. These tubes communicating with the water spaces, the water circulates in them constantly, so that the interior walls are protected against the consequences of the intense heat produced by the combustion of anthracite. * * * The engine worked wonderfully well all the time, and it was noticed that there was no heating of the journals, such as is common in all new locomotives."

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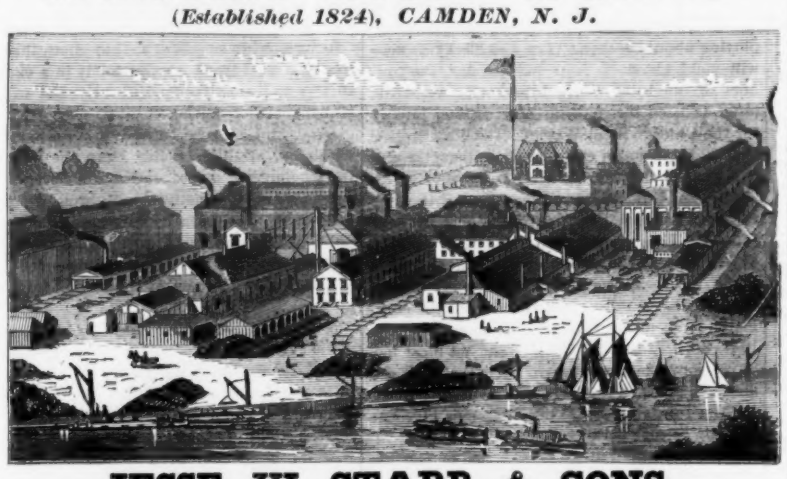

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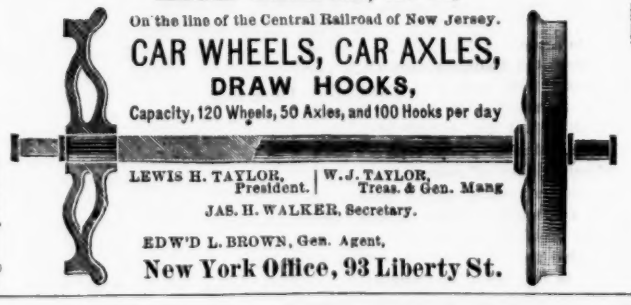

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Annealing.

In order to take the great hardness partially away which the steel has attained by hardening, it is subjected to a further operation: the annealing, or tempering, which consists in a low heating, and a subsequent slow or rapid cooling. By this operation the proper degree of hardness and elasticity can be imparted to steel with great certainty, since a comparatively low temperature, not exceeding 750° F., is necessary, and because the successively appearing annealing colors show very correctly the degree of temperature produced. The characteristic bright colors, from which one has to judge, are among the first; later on, the colors reappear, but less marked, and corresponding to other degrees of hardness. To repeat tempering is faulty, and ought to be avoided. A yellow tempering color in its various tints is imparted to instruments that are to remain hard, such as tools for working iron and stone; also to razors, surgical instruments, lancets, pen-knives, gravers, stamps, draw plates, etc. Most tools for wood working, such as axes, plane irons, scissors, table knives, etc., require a purple color; articles that are to possess elasticity and the hardness of a spring, and which ought to be touched by a file, need a violet or dark-blue color, such as sickles, scythes, blades, watch-springs, as well as springs of all kinds, hand and fret saws. Since hard steel anneals sooner than soft, and the latter sooner than iron, the various kinds of steel do not always exhibit the same degree of hardness, although they may show the same annealing colors, but there appear small differences, inasmuch as a brand cooled at a bright yellow heat may become as hard as one cooled when of a straw yellow color; or another one may get as hard when violet as one that has been dark-blue. In some cases, especially when a particular hardness is required, as is desirable for the edges of astronomical and physical instruments, and when the steel is rich in carbon, it may be proper to conduct the tempering at such a low temperature that no colors appear at all. And in order that the operator should not be subject to delusion in observing the change referred to, the steel should have a shining, and sometimes polished, surface, and be uniformly heated.

Since the colors owe their appearance to the formation of an exceedingly thin superficial skin of oxide, it is evident that the steel, when withdrawn from the fire, does not retain its first color, but there appear other colors in consequence of a subsequent oxidation by the air, until the steel is sufficiently cool. Of a certain color, one can only judge with certainty by examining the conditions under which it occurs. If two pieces of steel are heated until the yellow color appears, and if one is withdrawn, it may become in the air purple, violet, and finally blue, while the other piece assumes the same colors in the fire. However, if both pieces when blue are dipped into water, they assume different degrees of hardness, *i. e.*, the one which turned blue in the air will be harder than the one left in the fire. Hence, it follows that proper caution must be observed in this respect, and steel must either be cooled rapidly, when the right color appears in the fire, or it must be withdrawn at a preceding color, if the color is to appear by after annealing. Sometimes it is intended by the process of annealing to give to articles an attractive appearance, and at the same time to prevent them from rusting by the formation of a layer of oxide. In such a case uniform quality and heating is required.

The heating in tempering is generally conducted by clever workmen above an open charcoal fire, but special means are employed for special purposes. Small articles, such as screws, pins, needles, etc., are put upon an iron plate, which can be heated from below, or are placed in a sheet-iron drum, which is turned on a fire like coffee roasters. Scythes and similar tools are stuck in a layer of hot sand or hammer slag, spread on a heated plate, and sometimes only the hot sand is spread over them. To anneal sword-blades, it is recommended to employ a piece of cast iron as support, which is bent in the direction of the curvature of the blade and heated to glowing; if the edge is to get harder than the other parts it is necessary, while the latter are more strongly annealed, to protect them from further heating by covering both sides with rails, which are pressed toward them, or by passing over them with a moist body—for instance, with a potato or beet. Watch springs, crinoline ribs, band saws, steel wire, etc., are hardened and tempered in one operation, by drawing them through three pairs of plates provided with grooves, of which the first one lies in an oven to yield the necessary heat, and of which the second produces the hardening, and the third the tempering. Chesterman conveys the steel band to be treated through a glowing horizontal tube, and after it has passed the cold plates through two steel rollers, of which the lower one revolves in an oil tank, whereupon it is allowed to pass between the plates for tempering. Instead of cold iron plates an oil bath is used in many cases.

Oil and fats can find a proper application in tempering as well as in hardening, as it is thereby possible to impart to the steel a hardness corresponding to the blue annealing color. Thin articles, as springs, are best dipped into a tallow or oil bath, which is heated sufficiently to throw out a thick smoke, and begins to burn, whereupon they are cooled in the air or in water. Another very common method consists in coating the articles with a fatty substance, in case they have not already been immersed into fat in cooling, and then holding them over a fire until the fat commences to burn. With articles of considerable strength the operator may allow the flame to burn quietly, but in the case of thin articles the steel would begin to glow and lose its hardness, hence the flame must be suppressed. Aside from the means mentioned, metallic baths have been recommended, whose melting point lies at certain temperatures corresponding to the various annealing colors. For ordinary use they are not very suitable, but, as experience shows, they can be of much advantage for certain purposes, if only care is taken to retain the liquid metal at a temperature near the melting point, and over heating is avoided. Tin and lead are used by themselves, or as alloys, by which it is possible to produce temperatures between 430° and 630° Fah., within which are the various degrees of tempering. Less fusible alloys, consisting of tin, lead and bismuth, find scarcely any application, since steel is very rarely annealed at a temperature below that where the first light yellow color appears, and since other more convenient methods exist. With regard to the melting point of the various alloys of tin and lead, Parkes has published the following table:

ALLOYS FOR ANNEALING STEEL.

Alloys in parts of		Melting point F.	Tempering Color.	Applicable for.
Lead.	Tin.			
7	4	430°	light yellow	Lancets.
7¾	4	440°	straw y'low	Other chirurgical instruments.
8	4	451°	oat yellow..	Razors.
8¾	4	460°	gold yellow	Penknives.
10	4	480°	purple red.	L'ger knives, scalp'ls
14	4	500°	pigeon neck	Scissors, cold chisels
19	4	520°	pigeon neck	Axes, plane irons, pocket knives.
30	4	540°	violet..	Table knives, large scissors.
48	4	560°	copper red.	Sword blades, watch springs.
Boiling Linseed Oil.		600°	dark blue..	Saw blades & some partic'lar springs
Melting Lead.		625°	water	Articles a little softer than above

Tempering by means of metallic baths is accomplished by immersing the tools, and then laying an iron plate on the surface until the desired color appears. There exists a patent of James Horsfall, in Birmingham, bearing date of 1854, for a process which belongs to this class, and was used with success for the steel wires of musical instruments. The wire is first drawn out to almost the strength which it is to attain, after which it is heated to redness and cooled in oil or water. After hardening, it is dipped into a bath of molten lead and drawn out to the desired strength.

* Translated for *The Iron Age*, by Dr. Adolph Ott.

Boston After the Fire.

The Secretary of the Boston Board of Trade has published an interesting and valuable report embodying much new and exact information respecting the effect of the great conflagration upon the material progress and commercial prosperity of the city. It is especially rich in statistics founded on accurate inquiry or close estimate. It shows that the value of the property destroyed was out of all proportion to the extent of the land burned, and as compared with other great fires in other cities. The Chicago fire of 1871 burned over 2100 acres, and the total loss was $196,000,000, of which $53,000,000 was estimated as the value of the buildings and $143,000,000 as that of the merchandise and personal effects destroyed. The conflagration in Portland in 1866 covered 200 acres, and destroyed property to the value of $10,000,000. The fire in Hamburg in 1842 destroyed 61 streets and 1749 houses, rendering one-fifth of the population homeless; the loss was estimated at $35,000,000, of which $15,000,000 was the value of the houses. The fire of London, in 1666, raged four days and nights, and reduced to ashes five-sixths of the city within the walls. The ruins covered between 300 and 400 acres, or, as Macaulay describes the area, from the Tower to the Temple, and from the river to the purlieus of Smithfield. Four hundred streets and more than 13,000 houses were destroyed, and the loss was placed at £10,000,000 to £12,000,000 sterling, according to the value of money at that day.

The territory burnt over during the late Boston fire was about 65 acres, comprising 776 buildings. At the time of the fire, and immediately after, there was much exaggeration of statement in reference to the amount of property destroyed. The most careful estimates placed the loss at from $80,000,000 to $85,000,000; but it is now believed to have been not more than $75,000,000. Mr. Thomas Hills, Chairman of the Board of Assessors, published a statement on the 11th of November, estimating the value of the buildings destroyed at $14,000,000, and of the personal property, on the most liberal calculations, at about $70,000,000. In a recent note to the Secretary of the Board of Trade, Mr. Hills says, referring to this statement: "The figures were made at a time when most extravagant accounts were used in connection with the subject of loss. I found myself very much below the estimates of gentlemen for whose opinion I had a high regard, and fearing a tendency on my part to underestimate, I threw every doubt I entertained, with a safe margin, into the column of loss. My opinion then was, and now is, that $75,000,000 is the best estimate of the total loss." Of this amount about $13,500,000 may be taken as the assessed value of the buildings destroyed, which, however, it will probably cost $18,000,000 to replace; and the remainder is the value of the personal property. The assessed value of the land burned over was $25,000,000. In reference to the merchandise destroyed, it has been estimated that the boots, shoes, and leather amounted to $11,000,000; the woolen goods to a similar value, and the wool (about 11,000,000 pounds) to $5,500,000. No estimate of the cotton goods burned has yet been made.

Strange to say, the interruption to business, and the confusion resulting from the destruction of so large an amount of property, and of so many of the most available warehouses and offices in the city, were but temporary. Before the first week had passed almost every firm which had been driven from its old premises had found a new temporary home, very unlike, indeed, in most respects, that which it had lost, and often very circumscribed in its limits, but still enough for the transaction of business for the time being, and for the winter season then setting in. The greatest inconvenience resulting from the general change has been found to be in connection with the scattering all over the city of particular branches of business which had concentrated upon or near the now devastated territory; but both buyers and sellers have already begun to be accustomed to this, and it is something not likely to be of long continuance. The only interest which has been seriously disarranged in its operations is the ready-made clothing trade. Several very large establishments were burnt in which men's clothing was manufactured for the South and the West, and it has taken some time to reconstruct the machinery and to reorganize the labor for the reconstruction of this industry. But the work has made satisfactory progress.

There have been few failures in Boston as the result of the fire, and these have been almost exclusively among the dry goods jobbers, who were caught at the hight of their autumnal season with very heavy stocks and with inadequate insurance, and who, with others, had to accept part payment on much of their insurance. In concluding this part of the report, Mr. Hill says: "It will be enough to say of the fire, in its relations to the business of Boston, that while the manufacturing and financial interests of the city and Commonwealth have suffered but slightly, the shipping trade, foreign and coastwise, the business of the Corn Exchange, including provisions, the West India and grocery, the fish, the furniture, the iron, and the lumber trades, and to a considerable extent the hardware and earthenware, and the general retail trade, have not been directly injured or impaired by the fire. Nor is there the slightest reason to believe that the business of the city, as a whole, will sustain any permanent injury from the disaster. The loss is indeed a heavy one, but it has fallen upon a wealthy and prosperous community, and it has been distributed through the local insurance companies among a large number of our people, as well as among other communities represented by the branches of their insurance companies here. And in saying this it is not forgotten that to particular firms and to particular individuals among us the fire has proved a calamity from which it will require long years to recover, and that in instances not a few there can be no recovery. With the destruction of more than $70,000,000 of property, there must be much personal disappointment, hardship, and suffering; but speaking of Boston as a commercial city, as a center in which capital has accumulated, whose enterprise is quick, whose energy is indomitable, whose organic life endures not for decades but for generations, and whose growth is favored no less by all concurring circumstances than by inherent vitality and healthfulness, this loss, heavy in itself, will prove only a temporary embarrassment and check to its development, and will impress upon it no enduring mark of evil. Incidentally, also, in widened thoroughfares, in more securely built structures, and in more complete arrangements for the safety of property, the fire will be made the means and occasion to the city of lasting good. This has been the experience of other cities which have been similarly visited, and there is every indication that in our case there will be no exception to the rule.

Industrial Progress in Italy.

A correspondent of the *World*, of this city, writes as follows:

The agricultural products of the Italian kingdom are equalled, if not surpassed, by her mineral resources, when these latter are once brought in contact with speculative capital. Italian marble already holds the first place. Elba gives iron ore scarcely inferior to that of Sweden. Zinc and lead are found in Sardinia. Sicily supplies the world with sulphur, to which may be added alum, borax, coloring earths, &c. The mineral products have doubled their annual value since "the kingdom;" and zinc in particular is in active demand to supplement the insufficient yield of this important article for the modern industrial arts.

Metallurgical industry is at present in an experimental condition. The grand element, coal, is wanting to success. The most careful surveys have only discovered lignite. Even forest fuel is of insufficient quantity to furnish charcoal for smelting purposes. But while nothing can be yet done, all things are talked about, and the watchful attention of Italian chemists and engineers is directed to every new discovery in other countries which promises to make Italian ores more valuable. The creation of an iron interest is a fruitful topic for speculation, even for blame to the government for not doing more than it can. The mines of Elba, famous for centuries, were mortgaged in 1851 to cover a sum of money borrowed by a former Grand Duke of Tuscany. Part of these mines will be resumed, and to satisfy the impatience of parties with more patriotic zeal than commercial wisdom, an attempt will be made to get Bessemer steel out of the Elba ore, with insufficient fuel. The judicious are not sanguine of the result. Meanwhile even the agitation has its value as showing the estimate set by this new-born nation on an industry upon which all others in modern life are so dependent. This earnestness will at last yield to reason and experience, and if iron cannot be made on the spot, the ore may be raised and shipped, and be more than reimbursed by the manufactured metal.

Excepting this metallurgical flight the industrial evolution of Italy is worthy of admiration. The government has done its part in inquiries, reports and publications. It has directed and succored labor and industry, and has paid respect to all well-considered recommendation. A commission was organized two years ago, embracing men of eminence, engineers, manufacturers, economists, who have visited all important cities and outposts. The sessions were public, and every one was heard that had anything to say. The grievances of labor make a prominent part in these inquiries, and the government reports are made on the spot, so that the public are kept well informed. Technical schools and institutes are generally called for.

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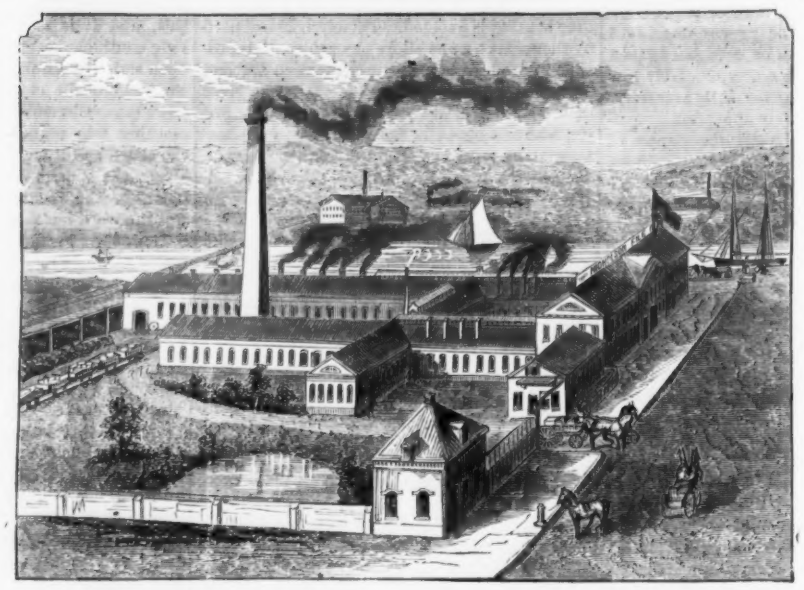

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Our prices are as low as it is possible to furnish a really first-class File *from the best of File Steel*, and may be had, with full terms and conditions, by addressing the

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IRON AND BRASS SCREWS.

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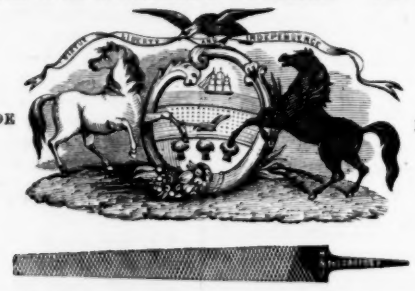
Self-Righting Cuspadore.

PENNSYLVANIA FILE WORKS.

TRADE  MARK

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Improved Barn Door Hanger & Rail.

Patented April 11, 1871.

This Rail has a brace on both sides which brings it in the middle of the sill, and steadies it in such a manner that it cannot tip over or work the screws out. The hanger has a shoulder or projection at the top which allows the roller to sit squarely upon the rail, and prevents it being thrown off. The sheave and axle are cast in one piece, which keeps the sheave from turning over against the sides of the hanger. The entire bearings of the axle are chilled, causing it to work easily, and to be durable.

Fig. 1—Shows Hanger with the Projection (A) corresponding with the Brace (D) of the Rail.

Fig. 2—Shows the Rail with Double Brace (D and E).

Fig. 3—Shows Sheaf with Cas Axle (B) and Shoulder (C).

Figs. 4 and 5—Show chills used to chill the Axle (B) and its bearings.

SKINNER & COOLEY, Watkins, N. Y.

WILLIAMS WHITE & CHURCHILL,

Successors to

MACKRELL & RICHARDSON MFG. COMPANY,

Manufacturers of

Builders' Hardware,

Locks, Hinges, Hooks and Staples,
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Champion Noiseless Pulleys,
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Manufacturers of

Fork, Hoe, Rake, Shovel, Broom & "D" Handles & Lumber.

First-Class Goods made from best *White Ash.*

Goods suitable for California, Australia and European trade made to order and packed for Ocean transportation. All goods warranted satisfactory

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Malleable Iron Works,

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Store—34 and 36 McWhorter Street, NEWARK, N.

Malleable Iron Castings, from AIR FURNACE or Cupola, furnished to order.

Small Gray Iron Castings, soft and smooth.

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Manufacturers of Waterman and Russel's

PATENT IRON STRAPPED BLOCKS,

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SOLE AGENTS FOR

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Manufacturers of Judds', Prindle's and Combination Patent Curtain Fixtures, Locks and Curtis' Patent Raisin Seeder, Patent Twine Boxes, Picture Nails and Hooks, Escutcheon Pins, Coat and Hat Hooks; also Miscellaneous Iron and Brass Goods.

Small Brass and Iron Castings made to order.

64 Duane Street, NEW YORK.

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We carry a full stock of the SUPERIOR ENAMELED WARE, manufactured b Alborn, Hartje Wiley & Co. Also, Hood's Patent Soapstone Sad and Polishing Irons.

BUSINESS ITEMS.

NEW YORK.

A correspondent of the Utica *Morning Herald* says: At Fort Plain reside Messrs. Clark & Smith, proprietors of the Fort Plain Spring and Axle Works. The establishment is well worth a visit. There are manufactured all sizes of steel axles, for light road wagons, for democrat wagons, for farm wagons, for express drays, and for all manner of work, from the lightest to the heaviest. With the kind permission of the reader, we propose to make the tour of the spring and axle works. At the extremity of the east wing of the establishment, our attention is called to a sluggish pair of immense steel shears, the ponderous jaws of which open and shut with the precision and deliberation of entire content. Between these mammoth jaws are thrust bars of iron and steel, which are bitten off so easily, so carelessly, and with such an evident lack of effort, that one feels a desire to put a 10-pound cannon, or something of that kind, between the shears, just to see what they would do. The shears cut the iron and steel into the proper length for axles. Then one end of the bar is heated, and it is put under a hammer, which descends upon it with the combined force of strong machinery and compressed air. This hammer rounds the end for the wheel, and draws it a trifle toward a taper. The axle, now having nearly the desired shape, is next turned over to the turners, who distress it by a variety of whirling processes, until its afflictions have reduced it to a state of polish and civilization. During this time it is fitted to the box, which has been cast by making a solid hole of core sand, and running melted metal around it, softened with a nitric pickle, and brought to terms in other ways. The axle having been brought to a fitting sense of its duties and condition, a friend in disguise takes it and bunts its head against a grind stone, until it sees stars—or at least until every one else sees stars, and so it is complete. We do not expect any one will be competent to start axle works after reading this description. We do not make the description any clearer, because we do not exactly understand the rest of it ourselves. When finished, the axles are stacked up in cords of iron solidity. The business seems to be immense, and we are not surprised to know that shipments are made to all parts of the Union. The department for the manufacture of springs is as complete, but did not interest us in as great a degree. Some of the work here is done by very ingeniously arranged and complete machinery. The establishment adds not a little to the prosperity of Fort Plain.

The Buffalo Car Works are now in full operation. The buildings comprise a wood machine shop 160 by 73 feet, an erecting shop 180 by 73, a blacksmith shop 189 by 60, with 20 fires; a machine shop 80 by 60, a pattern shop 70 by 60, and a store room 35 by 60 feet. There is also a fire-proof paint-house 24 by 16, and an engine-house 45 by 45 feet. The capacity of the works is from six to eight freight cars per day. The shops are situated between the Erie and the Buffalo, New York and Philadelphia roads, and side tracks from both roads are laid into the yard of the car works.

Jamestown is to have a new axe factory, work on the building having already commenced.

NEW JERSEY.

The Watson Manufacturing Company, of Paterson, have just finished a lot of 150 cast iron lamp-posts, destined for Chili.

The Todd and Rafferty Machine Company, Paterson, with a working capital of $250,000, are building a great variety of very heavy machinery, engines, etc., including rope machinery and Green's variable cut-off engine.

PENNSYLVANIA.

Messrs. Munsfield & Co., Pittsburgh, have greatly increased the capacity of their foundry and finishing shops for the manufacture of plumbers' and steam fitters' brass-work. Their anti-friction metal has become quite popular with the trade.

Wood & Co.'s rolling-mill, McKeesport, which has been standing idle two or three weeks for repairs, will commence operations again on the 10th inst.

The Erie Forge Company has been organized, with George W. Starr as secretary, William Spencer, clerk, and J. L. Russell, treasurer. They propose to manufacture car axles and other forgings of the best description.

The Fairfield Rolling Mill, at Philadelphia, was burned on the 27th ult., and machinery ruined. Loss, $30,000.

It is reported that a great steamship company, called the "Messagerie Maritime Italiene," which has been organized in Italy for recovering the great Oriental traffic which that country once enjoyed, will have four of its iron steamers built on the Delaware. The new company are to have twenty steamers, and the capital will be 100,000,000 francs or $20,000,000.

The rolling mill of Seyfert, McManus & Co., at Reading, has suspended operations for several weeks, owning the difficulty of procuring bituminous coal.

Mathew Rankin, of Warren, Ohio, intends to build a machine shop at Jamestown.

MASSACHUSETTS.

The Lowell Machine Shop was incorporated in 1845. Capital stock $600,000. There are six shops, smithy, and foundry. The number of males employed is 1000. The annual consumption of wrought iron is 900 tons; cast iron, 5700; steel, 180; brass composition, 55,000 lbs.; feet of lumber, 1,400,000. The manufactured goods consist of cotton machinery, paper machinery, Boyden turbine wheels, shafting, mill gearing, machinists' tools, boilers, hydraulic presses, castings, &c. The consumption of anthracite coal is 3500 tons annually, beside 600 tons Smith's coal, 7500 bushels charcoal, 450 cords wood, and 7200 gallons oil. There are in use four turbine water-wheels.

There are now 300 men employed in the United States Armory at Springfield. In 1864 there were 3000. These are the largest and smallest numbers ever employed at the armory.

Beside the manufacture of brass goods for steam, gas, and water works, Hallowell & Wright, Lowell, make a specialty of hose couplings, hydrants, and hydrant chucks, the latter a new invention of decided merit. Their goods are sold throughout the country, and they do a business of $15,000 per annum.

The Northampton Emery Wheel Co. have their arrangements completed for resuming the manufacture of emery wheels, and are now in running order once more.

Two large belts were recently manufactured by the Union Belt Company, of Fall River, for the Border City Mill, of that city. One of them was 347 feet long and 38 inches wide; the other 368 feet long and 35 inches wide. The hides of 400 animals were required to furnish the leather. The belts will cost about $14,000.

RHODE ISLAND.

The Corliss Steam Engine Co., Providence, are now employing 587 men, and when the new building is completed, which the company is now erecting, their complement of workmen will be increased to 1000. They have just put an engine into the new works of the Union Steel Screw Company, Cleveland, O., which has a 30-inch cylinder, with six foot stroke, the fly-wheel weighing 25 tons. This makes 40 engines put in by this company having the same power, and 120 engines having 20-inch cylinders, beside many others of less power, making about 575 in all. The Corliss engine is reckoned as among the best, and this concern is among the most successful in the country.

VERMONT.

B. F. Rollins, of St. Johnsbury, manufactures horse-powers, separators, drag and circular saw machines, &c. A business of $12,000 is done yearly.

The St. Johnsbury File Works, owned and operated by James Nutt, make mill and taper saw files and tanged horse rasps of English steel, and also recut files and rasps to order. Employment is furnished to 10 men.

CONNECTICUT.

The famous Chicopee Bronze Works are to have a branch at Meriden.

MAINE.

The North Vassalboro' Manufacturing Co. gives employment, directly and indirectly, to about 400 hands. The monthly pay-roll is about $10,000. The net earnings of the mills for the last six months were about $75,000.

MAINE.

The Patten Car Works, owned and operated by J. F. & J. Patten's Sons, at Bath, are now completed and in running order. These works comprise the following buildings: the wood machine shop, 150 by 75 feet, and two stories; the erecting shop, 220 by 75 feet; the blacksmith and machine shops, 180 by 50 feet; the paint shop, 162 by 75 feet; and the office, 36 by 25. The establishment is filled with new machinery of the latest patterns, which is driven by a steam engine of 100 horse-power. The lower story of the wood machine shop is filled with heavy machinery for the manufacture of all kinds of cars, and the upper story contains lighter machinery. In the erecting shop are eight tracks, and room for setting up eight passenger or sixteen freight cars at a time. The machine shop contains an engine-lathe, a hydraulic wheel-press, a bolting machine for wheels, bolt-cutting machine, drills, etc., etc. In the blacksmith shop are six fires, a furnace and bolt-machine, which can turn out 2000 bolts per day. These works give employment to about 200 hands, and must be esteemed the most important industrial establishment in Bath, to whose prosperity they will materially contribute. The Messrs. Patten—sons of the eminent ship-builders of the same name—have secured the services of Mr. J. W. Trussel, formerly master car-builder on the Portland and Kennebec Railroad, who will act as superintendent. These works are not surpassed in convenience and completeness in the United States.

OHIO.

The Cambridge *News* says the Baltimore and Ohio Railroad Company has made an offer to the Ohio Iron Company, at Zanesville, to take all the iron they can manufacture for a year, running day and night.

The $1,000,000 capital stock to the Ætna Works, Ironton, has all been taken, and the election of directors will be held on the 25th inst.

The Union Steel Screw Company, of Cleveland, have got their machinery at work in their new building, and by this time are probably making screws. They have a fine 300 horse-power Corliss engine.

The Cleveland Tube Works, Scovill, Chase & Co., proprietors, are now in operation, running on nothing but weld tubing. They will soon be in complete working order, making also boiler flues and lapweld piping.

The Cleveland Foundry—Bowlers, Maher & Brayton, proprietors—are running to their full capacity on car wheels and other castings. Their car wheels are much sought after, as they are known to make a superior casting.

Jones, Crane & Co., Cleveland, founders, have largely increased their capacity, by putting up another cupola, and an addition to the building. They have been very successful during the past season.

The Machine Shops of Lambert and Gordon, Ironton, have paid, during the past year, $36,000 for labor—employing on an average 52 hands the year through.

MICHIGAN.

The Adrian car shops at Adrian, with six new coaches, were burned December 28. The loss is $75,000. One hundred and fifty men are thrown out of employment.

UTAH.

The Salt Lake Iron Company has been formed in New York—capital $1,000,000—and has bought out the Salt Lake Iron Works.

KENTUCKY.

A new furnace is being built near the Lambert Ore Banks, in Carter county, calculated to produce 25 tons of charcoal iron per day.

Saws.

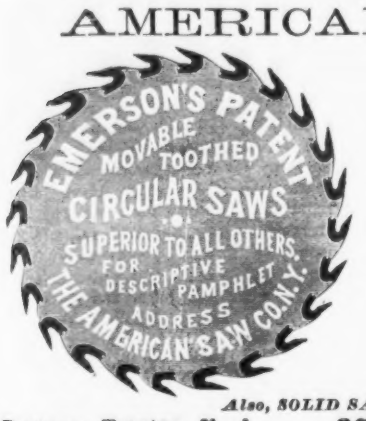
H. W. PEACE,

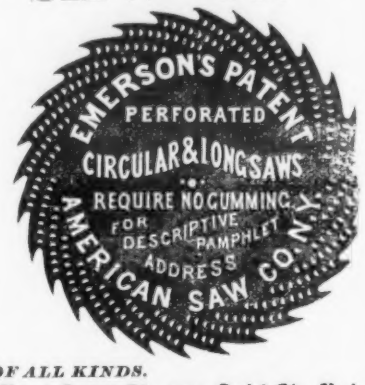
MANUFACTURER OF

SAWS OF ALL KINDS.

FACTORY, WILLIAMSBURGH, N. Y.

AMERICAN SAW CO.



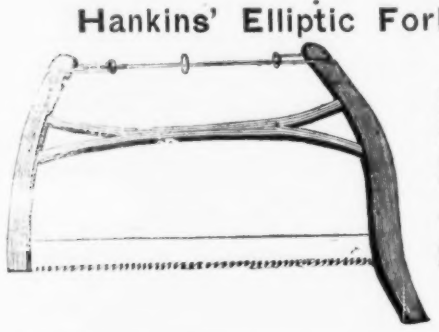


Also, SOLID SAWS OF ALL KINDS.

Factory, Trenton N. J. Office, No. 1 Ferry St., cor. Gold St. N. Y.

Hankins' Elliptic Forked Saw Frame.

Patented June 28th, 1870.



The annexed engraving represents HANKINS ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any centre bolt, secures for the Frame great strength and durability.

These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

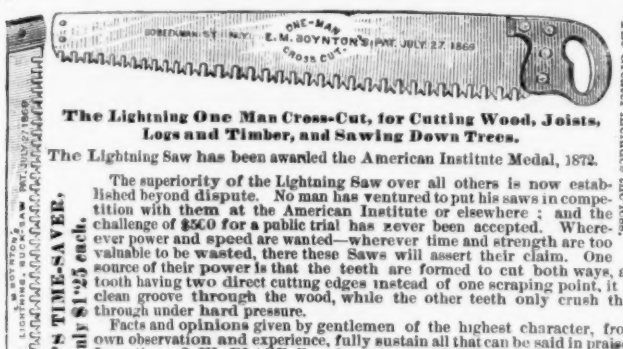
HARVEY W. PEACE.

VULCAN SAW WORKS,

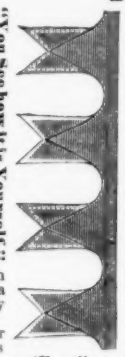
WILLIAMSBURGH, N. Y.

BOYNTON'S LIGHTNING SAWS.

Front Edge View showing two points of M tooth dressed to cut in line on one side, and two on the other.



The Lightning One Man Cross-Cut, for Cutting Wood, Joists, Logs and Timber, and Sawing Down Trees.



The Lightning Saw has been awarded the American Institute Medal, 1872.

WORKINGMAN'S TIME-SAVER. With Frame, only $1·25 each.

The superiority of the Lightning Saw over all others is now established beyond dispute. No man has ventured to put his saws in competition with them at the American Institute or elsewhere; and the challenge of $500 for a public trial has never been accepted. Wherever power and speed are wanted—wherever time and strength are too valuable to be wasted, there these Saws will assert their claim. One source of their power is that the teeth are formed to cut both ways, and each tooth having two direct cutting edges instead of one scraping point, it plows a clean groove through the wood, while the other teeth only crush their way through under hard pressure.

Facts and opinions given by gentlemen of the highest character, from their own observation and experience, fully sustain all that can be said in praise of this Invention. J. W. BLAKE, Esq., Superintendent of the American Institute, writes: "For all purposes of cross cutting large or small timber, your cross cuts and wood saws have no rival in speed or ease. Their universal use would save a vast amount of money and time, and lighten the labor of millions of men."

At the Bedford Farmers' Club, at Katonah, January 26, 1872, a leading farmer of Westchester county said that he had used the Lightning Cross-Cut Saw the last year, and that two men could cut more wood with it in one day, than in three with any other saw.

A practical lumber man also writes: "It is as easy to cut 20 to 25 thousand feet with the Lightning Saw as 8 to 10 thousand with the old V tooth. We get 80 cents per thousand for cutting—so the difference would pay for a saw in less than one day's work.

The Lightning Saws are now in use and for sale in every State and Territory of the Union, and are sent to foreign lands; indeed to very quarter of the world. More than 100,000 purchasers during the year 1872 add their testimony to the claims of superiority of the Lightning Saws.

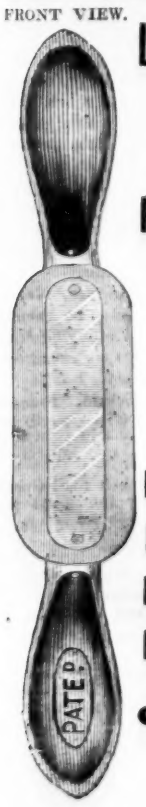
These Saws are of all sizes, from the fine hand-saw of one foot long, to the ten-feet California Cross-Cut. Two men can use the one-man Saw, by attaching one of Boynton's Patent Handles, removable at pleasure. Many imitations are abroad that are deficient in some essential features, and I am prosecuting infringers in the United States Courts. None are genuine unless they bear the name of E. M. BOYNTON, and the date of the four patents. Every such saw has been rigidly inspected before leaving the factory, and is warranted to coil to touch ends without injury. A six-feet Cross-cut and a Buck-saw blade will be sent for Six Dollars.

For Catalogue, Price List and additional information, please address

E. M. BOYNTON,

Sole Proprietor and Manufacturer, 80 Beekman St., New York.

FRONT VIEW. BACK VIEW



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ESTABLISHED 1852.

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We warrant our Knives equal in cutting qualities and workmanship to any made. We also make

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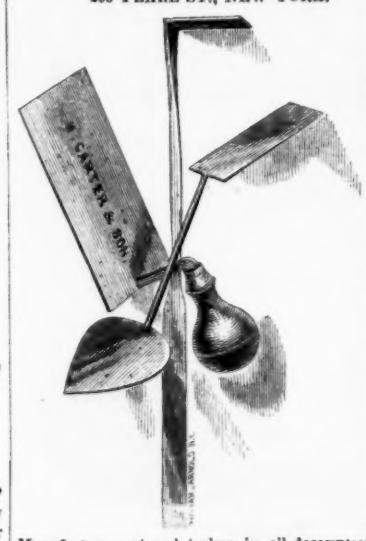

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WHEELER, MADDEN & CLEMSON

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OF EVERY DESCRIPTION,

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We make a specialty of the LARGEST SIZES of **Circular Saws**, and call particular attention of lumber manufacturers to the following points of excellence

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Our saws are ground on a patent machine, automatic in its operation, grinding off the thick places upon the plate before the thinner parts are reached, and when the saw is removed BALANCES PERFECTLY, which is proof positive of the right accomplishment of the work.

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We are sole proprietors and manufacturers of the celebrated **"Clipper" Cross-Cut Saw.** Price Lists of all kinds of saws sent on application.

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WM. McNIECE,

Manufacturer of

Superior Cast Steel Hand, Panel, Ripping, Ice, Compass, Hack, Butchers' Bow, Grafting, Pruning, Keyhole and Web Saws, Mowing Knives, Trunk Springs, And all other kinds of Springs, made from Sheet Cast Steel.

H. Croft's Scientific Concave and Convex Razor Strop

Is perhaps the only Strop manufactured on a strictly scientific principle. By a few passes over the Strop the Razor is enabled to pass through the hardest beard with ease, and is highly recommended by Barbers and all Scientific Men who have used it, and do cheerfully recommend it to be the best Strop that is sold in the market. The attention of dealers is solicited to this Strop, and wholesale men can have, on application, a sample Strop sent free of charge on application to the Patentee at Springfield, Ohio.

Bigelow & Johnston's Annual Review, 1872.

Having again reached that point in the year's trade when it is customary to pause and review the past, we may be permitted, first of all, to congratulate our friends on its exceptionally prosperous character in nearly every branch of the Iron Trade, and to express the hope that the year on which we are entering may not be less so than its predecessor.

Without doubt the year just closed has proved itself successful almost beyond precedent, if high prices and a large demand be taken as proofs of prosperity; indeed, it is questionable if in the whole history of the IronTrade of the United States, there can be selected a single year that will compare with 1872.

One year ago we called attention to the excited state of the European markets, and particularly to that of Great Britain, remarking and commenting at the same time on the surprising contrast presented by the trade here, and bearing in mind the close connection of the two markets, it was not difficult to foresee that they could not long continue to present antagonistic features. Early in January a change became manifest, but few, however sanguine, would have ventured to predict the enormous advance accomplished during the spring, and it was long before operators really comprehended their position. The suddenness and rapidity of the advance caused a scramble for goods, and it seemed as if an army of consumers had suddenly sprung into the field, of whose existence no one had previously been aware, and whose wants were at once urgent and imperative.

The question naturally arises as to the cause of this sudden change from great depression to excited activtiy, and in estimating it we must take into consideration a variety of circumstances. It is impossible to trace it up to any one cause, and there have not been wanting those who, viewing the whole advance as merely speculative and visionary, concluded that it could only be temporary. This might with many be partly attributed to a constitutional aversion to all sudden and violent changes in values, the consequent disturbance of well laid plans, and the low prices which for four or five years we had been accustomed to view as normal. Others again, more sanguine, saw in the changed aspect of the trade only the natural outburst of a healthy, vigorous industry, too long pent in by narrow bounds, feeling assured that consumption all over the world, and particularly in this great and prosperous country, had been silently but steadily overtaking the capacity of production, and that consequently, the great advance accomplished was but the prelude to still greater progress.

It surely concerns all who are interested in the trade to study the question and ascertain, as nearly as possible, what influences have most conduced to effect so marvelous a revolution in so short a time, whether it is natural and healthy, and in consequence permanent, or speculative and merely temporary; and what in addition are to be the ultimate effects on this great branch of the industrial resources of the United States. It will of course be impossible within the limits of this circular to enter at length into each of these points, but we will attempt briefly to sketch what appear to us most prominent among the influences at work.

To do this intelligently, we must cast our eye back to the spring of 1866, when there occurred in England the great financial crisis generally called the *Bank Panic.*

The war in the United States had fostered not only here but in Europe, India, and particularly in Great Britain, a strongly speculative fever, engendering in its turn a hollow and miserably false system of financiering, culminating in great commercial distress. Prices fell to a low point, and capital, frightened from its usual channels, took refuge in the great monetary centers. Enterprises involving large expenditures languished or were abandoned; the trade of the kingdom shrank, and the railroads, feeling the diminished traffic, ceased to be popular as investments, This in its turn reacting on the iron manufacturers so depressed prices that in 1867 and 1868 orders were taken more with a view to keep the hands together than from any profit accruing, and thus presenting no encouragement to embark in new enterprises of this kind. As time wore on and confidence returned, assisted greatly by the general prosperity in the United States during the years succeeding the establishment of peace, prices began gradually to improve with an increasing demand, though so gradually that it was still insufficient as a stimulus to any great increase in the production either here or in Europe. Capital seemed to prefer the more tempting fields of gold and silver mining, leaving iron, really the most valuable, comparatively neglected. Meanwhile, enterprises requiring an almost incalculable amount of iron were being set on foot and vigorously prosecuted; apparently, however, without overstraining the capacity for production, and without inordinately advancing prices. It was then that the trade began to get glimpses of a state of prosperity to which it had long been a stranger; but a severe check ensued in the outbreak of the Franco-German war, throwing everything into confusion, and causing a smart decline in prices, beside greatly curtailing consumption. Then followed the absorption of labor for service in the field, and consequent stoppage of works, such establishments as were not closed being drawn from the manufacture of peaceful to that of warlike material.

The decisive events which succeeded and occupied till the summer of 1871 are matters of history, and need not be referred to here; but equally important, in a commercial and financial point of view, has been the unprecedented transfer of capital from one belligerent to the other in the indemnity payments, threatening confusion at the centers of exchange, and filling to overflowing the treasury of Germany, where every branch of industry has felt the inflation and stimulus. Relieved of the incubus of the war, the necessity of replenishing depleted stocks demanded immediate attention, and the surplus capital sought an outlet in a vast number of undertakings requiring supplies of iron. England, of all the iron producing countries, being readiest to respond and easiest of access, naturally felt the first force of the wave, and hence the long continued activity there before we moved here.

We have entered into these details, dwelling particularly on the state of affairs in Europe, because they form a series of influences closely linked together and to them, acting simultaneously with greatly multiplied uses for iron all over the world, and the marvelous extension of the railway system in the United States, may be attributed much of the phenomena of the trade of 1871.

We are justified in concluding that the demand has been natural and legitimate, and not speculative. How long this state of affairs will last is a problem not easy of solution. Without doubt we must, to a certain extent, experience that lessened consumption which is the usual concomitant of high prices, but in Great Britain elements have entered into the question that require delicate handling. The vast increase in the price of labor and fuel have raised the platform of costs away from old figures, and it will be a long, slow process to return to the former standards, if, indeed, it were possible or desirable so to do. We do not therefore look for an early return to former prices, either of raw material or manufactured iron. That the ultimate effect on the iron industry of the United States will be good may well be conceded, though we by no means believe with many that the power of Great Britain as a competitor is permanently injured; but the future looks bright and, the daily extending purposes to which iron is necessary, justify us in saying that, with *wise legislation* and the well known enterprise of our people, there is no reason why the United States should not ere long occupy the proud position of the greatest iron producing country in the world.

We will be pardoned, we trust, this somewhat lengthy generalization, on account of the exceptional character of the year, and we will now refer under their respective heads to those articles coming more immediately under our own supervision in the course of business.

NEW RAILS.—The import in 1872, at this port, falls short of that of 1871 to the extent of 27,363 tons, though this by no means represents the actual decrease, as the import of Bessemer steel rails has greatly increased, and such are included in our aggregate quantity. Business in iron rails has for some months been slow and dragging in character, partly owing to the inability of some and the unwillingness of other railroad companies to follow the advance in prices. The investment of foreign and domestic capital in the bonds of new roads has also greatly fallen off, and the stringency which has been more or less for a length of time so marked a feature in our own money markets, has compelled the abandonment or postponement of numerous schemes. It is true that we have probably added some thousands to the completed mileage in 1872, and the urgent demands of commerce will continue to offer temptations to capital in this direction, but the number of schemes has been sifted down to those that are generally on a sound basis and really necessary to the comfort and prosperity of the sections through which they are intended to run. The manufacture of Bessemer steel rails has made steady progress, and there is a growing conviction, manifested not only in the abundance of orders enjoyed by those works devoted to this branch in the United States, but in the increasing imports from abroad, that to those railroads possessing a rapidly growing traffic, and whose resources will admit of the extra outlay, they are in the long run by far the cheapest material. We hope, during 1873, to be able to record separately, and as carefully as is possible, the imports at New York of Bessemer steel rails. The rail mills of the United States have generally been well employed, at least those located west of the Alleghany Mountains. In the East particularly on the coast, there has been a scarcity of paying work. Our production in that section has therefore somewhat fallen off, though we estimate the total for the year at all points to be not far from 700,000 tons. The mileage of completed railroads in the United States must now approach 66,000 miles, and for repairs alone this vast system must require, at the very lowest estimate, about 650,000 tons; there remains still, therefore, a respectable margin for the import of foreign rails to meet our wants.

In connection with this the question of the course of prices in the immediate future is of great practical importance, and purchasers who have held back in anticipation of a decline have had some justification of their judgment in the depression that has more recently been experienced in England. The latest advices however go to prove that no decline of magnitude can now be expected. In fact, in the face of the obstinacy of the wages and fuel question, it is hardly possible that the English makers can submit to any great reduction. For rails bottom seems to have touched at £9. 10/ to £9. 15/, with quotations now advanced to £10.

We subjoin the prices of foreign rails ruling at the commencement of each month in 1872, comparing with those at the corresponding period in 1871, with this remark—that the duty which till August 1st, 1872, amounted to $15·68 per ton, gold, became thereafter ten per cent. less, or say $14·12 per ton; but the change had no perceptible effect on prices

GOLD PRICES.

	Jan.	Feb.	March.	April.
1872	$58 to 59	62 to 63	65 to 65½	72 to 73
1871	55	54 to 55	55 to 56	55 to 56
	May.	**June.**	**July.**	**Aug.**
1872	$75 to 76	73 to 74	72 to 73	72 to 73
1871	55 to 56	55 to 56½	56½ t 57	56½ to 57½
	Sept.	**Oct.**	**Nov.**	**Dec.**
1872	$75 to 76	75 to 76	73	70 to 72
1871	56½ to 57½	57 to 58	58	58

OLD RAILS.—We again show a large import of this material, notwithstanding that consumption has been materially checked by the high prices. We close the year with a stock of about 8000 tons, which is considerably more than is usual. The cost abroad has been greatly enhanced the past year by the large demand from mills on the Continent and in Wales, and prices here ran up to a point which practically excluded purchases for the United States. During the spring, trade here was very active, and prices advanced by rapid strides to $55, gold, some sales being even reported as high as $56, gold. At this figure, however, the demand dwindled down to the most retail character, and as stocks began to accumulate, prices took a downward course, from which there was no recovery until $50, currency, became the highest price at which business could be effected, this, at the current premium on gold, being equal to about $44·50, gold. Our supplies this year have been largely from the Continent of Europe, but the high price tempted many of our own railroads into the market, thus supplying local mills at remunerative prices, but much below the cost of the foreign article.

It is evident that the trade was overdone, and even at present figures the prospect of revival is somewhat distant, as the reduced price of Forge pig iron, and the comparative scarcity of orders for new rails indispose purchasers. It is to be remarked, however, that shipments hither have greatly fallen off, and when the demand does revive, it must fall on the stock on hand, which would soon disappear, and probably at prices above what could be now realized.

Subjoined are the monthly quotations compared with those of 1871:

D. H. and T, gold.

	1872.	1871.
January	$40·00 @ 41·00	$39·00 @ 40·00
February	42·50 @ 44·00	38·00 @ 39·00
March	46·50 @ 47·00	38·00 @ 38·50
April	52·00 @ 53·00	38·50 @ 39·50
May	52·00 @ 54·00	39·00 @ 40·00
June	51·00 @ 52·00	39·00 @ 40·00
July	49·00 @ 50·00	39·00 @ 40·00
August	51·00 @ 52·00	39·00 @ 39·50
September	52·00 @ 52·50	38·50 @ 39·50
October	47·00 @ 48·00	38·50 @ 39·50
November	45·00 @ 46·00	38·50 @ 39·25
December	44·50 @ 45 00	39·00 @ 39·50

SCRAP IRON.—In common with other old material, this article at once felt the great demand of last spring, and became excited and active, advancing to a very high point. In April the maximum of $65, currency, was reached, since which there has been a gradual recession till we now stand about the figures from which we started a year ago. The demand has been very fitful, and the difficulty of taking care of such material on our docks has caused great variations in values. Many parcels come so mixed in quality that it is impossible to apply any exact standard, so much depending on the labor necessary for reassorting. The following tables, however, will give a general idea of the scale of prices for No. 1 Wrought ruling during the year:

CURRENCY PRICES.

Jan.	Feb.	March.	April.
$39 to 40	43 to 45	50 to 52·50	62·50 to 65
May.	**June.**	**July.**	**Aug.**
$62·50 to 65	58 to 60	50 to 55	50 to 58
Sept.	**Oct.**	**Nov.**	**Dec.**
$50 to 55	45 to 50	45 to 47	40 to 45

PIG IRON.—In this leading branch of the iron production of the United States, the year has witnessed a vast change for the better, and it has received an impulse which must result in greatly extending the area of production. One year ago we closed in comparative dullness a somewhat active season, with prices at a fair paying point, but not without symptoms of weakness. Our leading companies fearing an accumulation of stocks, similar to what had occurred in 1869-70, with its consequent low prices, were most willing to meet the first signs of reviving activity. Accordingly, about the middle of January, large sales of their product for 1872 were made on a basis of about $35 to $36 for No. 1 Foundry. The markets abroad, already higher relatively than ours, and stimulated by large inquiry from this side, and a continued home and Continental demand, became very much excited, and the reported rapid advances brought the trade here to fever heat, so that by the close of January a rise of $3 per ton from the opening price was already established, with the tendency still upward. Another month witnessed a further improvement of $4 to $5 per ton, and by midsummer No. 1 was quoted $55, at which point the advance came to a pause, though in many instances even higher figures were sometimes made, when immediate delivery was a "*sine qua non.*" One surprising feature during all this rapid increase of price was the positive scarcity of iron; and complaints of tardy delivery were not only plentiful, but the cause of much inconvenience. During the late summer months, and notably during fall, the trade seemed to languish under the high prices. The effect seemed to be stifling, and sales became more difficult, with some irregularity in prices. This was more observable in the case of second-rate brands, the leading Lehigh companies generally maintaining their ground; but the tone of the trade has for some time shown that confidence was shaken in the continuance of such extreme prices, especially as the English markets began to show great weakness. There was a general anxiety to clean up stocks, and start the new season at what might be termed more reasonable rates. As might be expected, strenuous efforts are being made in all directions to take advantage of such a prosperous state of affairs by increasing the means of production. New furnaces have been erected and old ones repaired, but it will probably be during 1873 that the full effect of these will be experienced, and many estimate the addition to our yield of nearly 500,000 tons before another season. Ores of good quality are, however, becoming scarce and high, and this may retard the increase to a certain extent. Opinions differ as to the probable opening price of Lehigh iron for 1873, but, judging by appearances, it will probably be in the neighborhood of $45 for No. 1 Foundry. The markets abroad have suddenly thrown off their depression, and the result here will probably be to prevent any great decline.

This country has happily been free from two very disturbing and perplexing questions with which the European iron master has had to contend, viz.: those of wages and fuel. Continued strikes and the increasing scarcity and dearness of coal and coke have rendered apparently great profits merely nominal, but in the United States neither of these troubles has as yet assailed us to any extent, and we trust it will be long before they do.

In Scotch Pig and other foreign irons our imports have been large, exceeding those of last year by 5000 tons. Of the quantity entered at this port a great proportion has been Bessemer Pig. Scotch Foundry Irons have met with a lively demand at greatly enhanced prices; though for some months those ruling here have not been up to the level of the cost abroad at time of sale. The reason of this is obvious, and need not be explained here. The stock on hand is very small, and as soon as trade opens we look for a considerable advance, as within a month the Glasgow market has gained great strength, and much of the decline which occurred during October and November has been recovered. This is to be attributed partly to the strike of the miners, but there is no doubt much of it is owing to the inherent strength of the market and the rapidly decreasing stock. The effect for the present is that the most inferior brands of Scotch now cost more than the best No. 1 American, a discrepancy which cannot last long.

We add for the information of our friends the subjoined prices of four leading brands ruling at Glasgow, 28th December, and received by cable, together with the stock at same date. We place in comparison the lowest price reached during the recent decline to show the extent of the recovery:

	28th December.	6th December.
Gartsherrie	140/	125/
Summerlee	1·3/	125/
Glengarnock	138/	112/6
Eglinton	123/	107/6
	1872.	**1871.**
Stock	94,000 tons	372,725 tons

We also give the cost with freight of same brands from Clyde to New York, in the first week of each month during 1872:

	Jan.	Feb.	March.	April.	May.	June.
Gartsherrie	105/	111/	121/	135/	135/	138/
Summerlee	101/	111/	121/	134/	133/	138/
Glengarnock	101/	106/	118/6	131/	131/6	135/6
Eglinton	93/	96/	110/	127/6	128/	12 /.
	July.	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
Gartsherrie	159/	170/	175/	159/	141/	140/
Summerlee	159/	165/	165/	149/	134/	140/
Glengarnock	152/6	166/	166/	152/6	137/6	122/6
Eglinton	141/	154/6	153/6	146/6	127/6	117/6

NEW YORK, January 1, 1873.

Mr. J. J. Bodmer, of Hammersmith, has invented an improvement in the manufacture of iron and steel, which relates in part to the application of injection by pressure to materials used in the manufacture of iron or steel. These materials are all descriptions of metallic oxides, minerals, or metals, or carbonized substances, which are applicable to the manufacture of iron and steel, either in a solid subdivided condition (however subdivided) by themselves, or as admixtures dry or mixed with liquids, or dissolved in liquids. This invention further relates to the construction and use of revolving or oscillating furnaces or vessels used in the manufacture of iron and steel, and to certain ways of treating the charge, whether in revolving or other furnaces for the said purposes. In carrying out this second part of the invention the applicant constructs the vessel of cast iron or of wrought iron, in one piece or in segments or in parts of a cylindrical, oval, square, rhomboidal, or hexagonal shape. When it is desirable as for puddling, or purifying, projections are made either in the shell or vessel itself, or by forming the initial or first lining accordingly. Arrangements and modes of proceeding as to the charge and charging are referred to.

The Hartford Steam Boiler Inspection & Insurance Co. makes the following report of its inspections in the months of October and November, 1872: During these months there were 2217 visits of inspection made, and 4162 boilers examined, 3922 externally, and 1311 internally, while 373 were tested by hydraulic pressure. The number of defects in all discovered were 1981, of which 493 were regarded as particularly dangerous. These defects were as follows: Furnaces out of shape, 102—23 dangerous. Fractures, 202—89 dangerous. Burned Plates, 138—52 dangerous. Blistered Plates, 267—35 dangerous. Sediment and Deposit, 420—25 dangerous. Incrustation and Scale, 383—45 dangerous. External Corrosion, 145—21 dangerous. Internal Corrosion, 55—7 dangerous. Internal Grooving, 22—8 dangerous. Water Gauges defective, 123—19 dangerous. Blow out apparatus defective, 32—8 dangerous. Safety Valves overloaded, 59—29 dangerous. Pressure Gauges defective, 235—33 dangerous. These varied from —10 to + 20. Boilers without Gauges, 145—25 dangerous. Cases of Deficiency of Water, 19—12 dangerous. Broken Braces and Stays, 49—34 dangerous. Boilers worn out and beyond repair, and condemned, 31. Many of the defects enumerated above, come from neglect on the part of the boiler attendants. The boilers are blown down under heavy pressure, or, having been blown down are filled up immediately with cold water, and bad fractures are caused. Some boilers have been found set with the minimum water line below the fire line. Theoretically, there is but one *water line*, and practically it should be the same, but we not unfrequently find water carried at different hights in the same boiler. The water gauges or try cocks, should be so arranged that water discharging from the lower one, indicates a sufficient hight above the fire line to thoroughly protect the sheets from overheating. Boilers should be cleaned often. The accumulation of mud and various kinds of deposit, renders the boiler liable to be badly burned. There are many "little points" that must be observed, if safety and economy are to be attained. "Little things" neglected often lead to *great* disasters.

Much interest has been excited during the past week by the newspaper comments on the reported prosecution of Messrs. Phelps, Dodge & Co. by the government, for the recovery of the sum of $1,000,000, "the value of certain goods, wares, and merchandise forfeited," &c., because, as alleged, imported on invoices not correctly representing the value of the goods. It is further stated that the check of their counsel, Mr. Wakeman, for an amount variously stated at $258,000 and $260,000, has been deposited with Deputy Collector Bliss, as a compromise of the claim. It is further stated that the offer is under consideration in the Treasury Department, at Washington. These are, so far as we know, the only facts which have as yet transpired.

The French are practicing, in the hilly country around Paris, the erection of military telegraphs. In the Buttes Chaumont Park, recently, where the cliffs and rocks are of the steepest, 50 soldiers of the engineer corps laid a perfect labyrinth of wires, and sent messages over all of them in half an hour.

A process for purifying water by means of spongy iron has lately been patented in England by Dr. G. Bischaf, of Bonn. A filter of spongy iron acts in this capacity rapidly and thoroughly, the most offensive water immediately losing its color and smell, and keeping sweet and in a serviceable condition for a long time.

The Standard Horse Nail Company propose to have their works in operation at New Brighton, Pa., by Feb., 1, 1873. This is the first works of the kind started in that section of the country.

A discovery has been made of an extensive bed of iron ore in Washington county, Md., on the farm of Mr. William Dodge, near Clear Spring. It is stated that it contains about 55 per cent. of pure iron.

There is a reported discovery of extensive coal fields at San Diego, in the Temeculah mountains.

The Iron Age Directory

and Index to Advertisements.

The New Bessemer Works at Dronfield.

A Sheffield paper thus describes the new Bessemer works of Messrs. Wilson, Cammell & Co. at Dronfield:

To persons visiting the works for the first time, the most striking feature in connection with them is the massive iron tubes which occupy an arched platform of brickwork, having a considerable elevation. These, of which there are ten, provision being made for five others, are the "cupola furnaces" used in the Bessemer process of making steel, and they are so arranged that the material by which they will be fed can be put into their capacious mouths with the least possible amount of labor, the sidings of the railway being at the same elevation as the "charging stage." The length of the platform, or as it is sometimes called "cupola stage," is 200 ft. or thereabouts, and its width 30 ft. Next in order is the "Bessemer converting house," in which the molten iron is converted into steel. This place of "conversion" is 200 ft. long, and 40 ft. or more wide, having suitable elevation. It is now being fitted up with the usual apparatus of the most approved kind by an eminent maker. The massive wrought iron "converters," or vessels which receive the seething metal, through which the "blast" is forced, and the powerful hydraulic cranes, of which there are three complete sets, are objects of much interest. On the south side of the Bessemer house the "engine house," which is a really handsome building of brick and stone, with long arched windows, occupies a conspicuous place. Its length is 60 ft., its width 30 ft., and its elevation 23 ft. One of the chief objects occupying this building is a well designed, massive, vertical high pressure steam engine for supplying the blast to the "converting vessels." Its nominal power is said to be 180 horse, its actual power being little short of three times that amount. At the east end of the engine house is the "accumulator house," 30 ft. by say 16 ft., with an elevation of 40 ft., at the top of which is placed a large water tank. Between the "accumulator" and blast engine there is a pair of powerful pumping engines for supplying the hydraulic pressure used for the manipulation of the cranes, etc., in the Bessemer house. The "accumulator" is a ponderous cylinder, 20 tons weight, through the top of which a large ram passes. The ram being loaded with a heavy weight, the engines force the water into this cylinder, producing the hydraulic pressure. The contractors for the masonry of this part of the works are Messrs. Foxton Brothers, and the manner of its execution reflects upon them deserved credit. Beside the manufacture of Bessemer steel, of which it is said 1000 tons per week can be produced when the works are fully developed, steel rails and railway carriage wheels, especially wheels for locomotives, will, it is said, be made under a new process from the solid ingot, without piecing or welding, and combining extraordinary strength and durability. This part of the works is also on an extensive scale. The rail mill, etc., when completed, will be 400 ft. long, and 180 ft. wide. The shed, for such it is, stands on metal pillars, which are securely bolted to ashlar foundations. On the top of the pillars are wrought iron girders, carrying the roof the elevation of the shed, its construction being such as to conduce in the greatest degree to the comfort of the workmen as well as to afford every convenience of manipulating the material in process of manufacture. By the side of the shed is a range of eight "two-flued" boilers, each 30 ft. long and 7 ft. high, to generate steam for the engines. The chimneys for carrying off the smoke of the furnaces, which have been designed in accordance with the most approved plans for the consumption of smoke, are 20 ft. square at the base, and have an elevation of 125 ft. The execution of this portion of the work has been entrusted to the well-known furnace builder, Mr. John Rodgers, Sheffield. The south side of the site is occupied by a longe range of buildings, including machine shops, such as planing, slotting, roll turning, and fitting shops, time-house, and general offices, the range being from appearance upward of 160 yards long, the contractors being the eminent firm of Messrs. Clubley & Stringfellow, Sheffield. A large reservoir for the supply of water to the works is being constructed on the site known as "Rotherham's Wheel Dam," situated at the back of the offices. At present it seems impossible to say when manufacturing operations will be commenced, the works being yet far from completion. It is hoped, however, that the Bessemer steel manufacture may be begun early in the new year, and the other part of the works opened shortly afterward. At first a limited number only can be employed, as but a part of the Bessemer steel works will be opened, finding work for two or three hundred; but as the works are completed the number will be increased to five or six hundred. Should, however, the whole of the site be utilized by extensions, as is believed to be most probable, one thousand hands may ultimately find employment at these important works, the putting down of which forms a new era in the manufacturing industries of Dronfield, and will add immensely to its growth and prosperity.

Close by the Mississippi, three miles below Le Claire, a seam of coal 28 inches thick has been discovered. It is on land owned by Wm. Suite. There were coal croppings at the edge of a bank about 300 yards from the river, and they dug into it for 30 feet and came upon this good coal. A singular quality of the coal deserves mention. It is more of the nature of cannel coal than anything else. It burns with a blue flame, gives intense heat, very little smoke, and leaves nothing but white ashes. You can cut it with a knife just as you can fire clay. The existence of the bed has been known four years, but everybody supposed it to be nothing but slate.

HILL'S "ARCHIMEDEAN" LAWN MOWER.

THE CHAMPION OF THE WORLD.

The first and only Balanced Lawn Mower made and operated by an Adjustable Handle.

The leading Machine both in the United States and Europe, having taken the Gold Medal at the great Fair in Hamburg, Germany, and the Premiums at every test trial in the U. S. Also the Silver Medal at the Cincinnati Exposition of 1872.

So well known is this favorite Lawn Mower that it needs no further recommendation. It has a greater reputation, and larger sale, both in the United States and Europe, than any Lawn Mower made, and the first and only one constructed upon those principles.

What we claim for it over others is ease of operating, *durability*, and beauty and evenness of its work.

We wish more particularly to call attention to the addition we have made to our list, of 2 sizes of Horse Mowers, and one beautiful little Croquet Mower for small Lawns and Cemetery Lots, which is the most complete thing of its kind made, and is easily operated by a Miss of ten years. Our list is as follows:

10 inch Croquet Mower, for Miss, $20·00. 14 inch, for Man - - - - - $25·00.
12 inch, for Boy - - - - - 22·00. 28 inch, for Pony - - - - 100·00.
32 inch, for one Horse - - - $125·00.

Send for circulars. Manufactured by the

Hills Archimedean Lawn Mower Co.,

Colts Armory, Hartford, Conn.

Biddle Manufacturing Co.,

FINE TOOLS

AND

Hardware Specialties.

We call the attention of **Carriage Makers, Machinists, Iron Railing Manufacturers, Blacksmiths,** and all others interested in **Drilling, Punching or Cutting Iron,** to our

Improved Drill Press, Shear & Punch,

feeling assured that upon examination their merits must be apparent to every one, from the fact that they possess the essential characteristics of strength, power and cheapness, in a high degree.

Illustrated Catalogues and Price Lists furnished on application.

We are also prepared to furnish light work of any description and in any quantity to order.

All kinds of Die Forgings promptly attended to.

OFFICE & WAREROOMS, 78 Chambers Street, New York.

Philadelphia Tool Co.,

MANUFACTURERS OF

Davis' Patent Duplex Wrench,

A tool well made of **Best Materials,** combining all the good qualities of a regular Nut Wrench of equal size with that of at least six pairs of Pipe Tongs. For circulars and price lists, address,

PHILADELPHIA TOOL Co., Office & Works, S. W. cor. 13th & Buttonwood Streets, Phila.,
Or *GRAHAM & HAINES, Agents, 88 Chambers Street, N. Y.*

WM. H. STOYLE,

Manufacturer of MACHINE CUT BELT LACING,

And Dealer in

Superior Leather Belting, and Page's Patent Lace Leather,

By the Side or Dozen.

403 Library Street, Philadelphia.

DESIGNING AND ENGRAVING ON WOOD

52 JOHN ST. H. R. WHITE NEW YORK.

A. FIELD & SONS,

Manufacturers of

COPPER & IRON TACKS, TINNED TACKS,

SUPERIOR SWEDES IRON TACKS,

For Upholsterers' use, Saddlers' supply, Card Clothing, &c., &c. **AMERICAN** and **SWEDES IRON SHOE NAILS,** Zinc and Steel Shoe Nails, Carpet, Brush and Gimp Tacks, Common and Patent Brads, Finishing Nails, Annealed Trunk and Clout Nails, Hob and Hungarian Nails.

COPPER AND IRON BOAT NAILS.

Fine Two Penny and Three Penny Nails, Channel, Cigar Box and Chair Nails.

Leathered Carpet Tacks, Glaziers' Points, &c., &c.

TAUNTON, MASS.

☞ Any variations from the regular size or shape of the above-named goods made from samples, to order. Orders by mail promptly filled.

OFFICE AND WORKS, Cor. 2nd & Diamond Sts.

MACHINERY FOR THE MANUFACTURING OF HUBS & SPOKES.

J. GLEASON

PHILADELPHIA, PA.

Burnet & Leonard,

Steam Boiler Manuf'rs,

2d Wharf above Bridge St., Newark, N. J.

Vertical Boilers, 2 to 20 Horse Power, constantly on hand.

BONNELL, BOTSFORD & CO.,

Youngstown, O., Wholesale Dealers in

Bar, Boiler, Hoop & Sheet Iron,

NAILS and SPIKES,

Gas Pipe, Nuts and Washers, Carriage Bolts,

Swedes Iron, Cast Steel, Spring Steel, &c.

AMERICAN TACK Co.

ATC

MANUFACTURERS OF

Copper, Swedes, and Iron Tacks,

BRUSH, LACE AND GIMP TACKS,

Leathered, Tinned, and Iron Carpet Tacks; Finishing, Black, and Tinned Trunk Nails; Hungarian and Cigar Box Nails;

COPPER and IRON BOAT NAILS;

ZINC, COPPER, STEEL, and IRON SHOE NAILS

2d and 3d FINE NAILS;

Bright and Tinned Roofing Nails,

BRADS, PATENT BRADS, &c,

Factory, Fairhaven, Mass.

Salesroom, 117 Chambers Street, NEW YORK

N. B.—Any variation from the regular size or shape of the above named goods cut from sample to order.

Established in 1812.

HOBART'S TACKS.

Manufactured by

Dunbar, Hobart & Whidden,

Office and Salesroom,

35 Chambers Street, N. Y.

Factory, SOUTH ABINGTON, MASS.

Manufacturers of

American, Swedes and Copper Tacks, Tinned, Leathered and Large Head Tacks, Finishing Nails, Black and Tinned Trunk Nails, Miners', Gimp, Lace and Brush Tacks, Hungarian, Chair, Cigar Box and Barrel Nails, Glaziers' Points, Iron, Steel, Copper, Zinc and Brass Shoe Nails, **HEEL and TOE PLATES, STEEL SHANKS, and FANCY HEAD NAILS, SILVER or JAPANNED LINING and SADDLE NAILS.**

A full assortment always on hand at salesrooms, for immediate delivery if required.

Odd and irregular sizes made to order or cut from sample at short notice. Send for Price List.

COBB & DREW,

Plymouth, Mass.

Manufacturers of Copper, Brass, and Iron Rivets; Common and Swedes Iron, Leathered, Carpet, Lace and Gimp Tacks; Finishing, Hungarian, Trunk, Clout and Cigar Box Nails, &c. Rivets made to Order.

NEW YORK AGENCY,

GEO. C. GRUNDY,

Successor to **Disosway & Grundy,**

No. 12 Platt St., NEW YORK

Agent for the Philadelphia Star Carriage and Tire Bolts.

SAMUEL LORING'S

PLYMOUTH TACK AND RIVET WORK

PLYMOUTH, MASS., manufacturer of

TACKS, BRADS, NAILS AND RIVETS.

Swedes and Common Iron Tacks; Leathered, Carpet Brush, Lace and Gimp Tacks; Finishing, Hungarian 2d, 3d and 3d Fine, Trunk, Clout, and Cigar Box Nails Black and Tinned Trunk Nails; Zinc, Iron, Copper and Steel Shoe Nails; Brads and Patent Brads; Glaziers' Points, &c., &c., &c. **COPPER, BRASS AND IRON RIVETS,** of all kinds. Coopers' Rivets from 1d to 6d, in casks of 100 lbs. each. Hose, Belt and Shoe Rivets and Burrs. Oval and Countersunk Heads of extra lengths, made to order. SHIP AND BOILER RIVETS OF ALL SIZES AND LENGTHS.

STEEL and IRON RAILS, SWITCHES and CROSSINGS.

The Contractors' and Engineering Agency are prepared to make contracts to specification for the above, with early delivery.

The C. and E. A. having running commissions for the sale of

OLD DOUBLE HEADED RAILS,

can generally supply orders immediately for One, Two or Three Thousand Tons. Special attention given to the selection of

Crucible and Cast Steel,

Galvanized, Sheet and Corrugated Iron

For Houses and Fencing.

Orders should be accompanied with Cash or Banker's References.

No. 4 Westminster Chambers, Victoria Street, London, England.

ROBERT WALKER, Manager.

For Sale, &c.

Hardware Business For Sale,

At Quincy, Illinois.

The continued increasing demand for our

PATENT AUTOMATIC STEAM GOVERNOR,

Requiring our undivided time and attention to the prosecution of its manufacture, we hereby offer for sale our entire stock of Hardware, together with lease, fixtures and good will. This business was founded at its present location in 1844, by Messrs. L. & C. H. Bull, now prominent bankers in this city, and has since been successfully carried on by themselves and successors in both Wholesale and Retail Branches. Parties desiring a safe and permanent business in a growing and prosperous locality will find this an excellent opportunity to establish themselves upon easy terms, and from such we invite a thorough investigation. Address

GARDNER & ROBERTSON, Quincy, Ill

Iron Foundry

For Sale or to Lease, with privilege to buy, situated at Peekskill N. Y., the Foundry, Machine Shops and other buildings, with water front on the Hudson River, powerful steam engine, and other machinery entirely new, the premises comprising over two acres, and suited for a large manufacturing business. Address **"Manufacturer,"**
Office of *The Iron Age*, 80 Beekman St., N. Y.

Rolling Mill Machinery For Sale

One train, 3 high, finishing rolls, with steam engine 75 H. P.; and balance wheel, 20,000 lbs.—complete and in good order—by

Fearing, Rodman & Swift,
23 & 25 Commercial Street, Boston.
Boston, Nov., 20, 1872.

Rolling Mills For Sale or Lease.

The *"CALVERT ROLLING MILLS,"* situated in the city of Baltimore, were withdrawn from the sale advertised on the 16th of May, and are now offered at private sale, or will be leased to responsible parties. The terms will be made advantageous. The Mills are in perfect order, and can be put in operation at short notice.

For full information address

ALEX. BROWN & SONS, BALTIMORE.

Valuable Iron Furnace and Ore Bank

In Amherst and Rockbridge Counties, Va., on the James River and Kanawha Canal,

For Lease at Auction.

Pursuant to a decree of the County Court of Rockbridge County, November 15th, 1872, in the cause of Sam'l F. Jordan's Executor, vs. Sam'l F. Jordan's heirs, we will, as commissioners, offer for rent at public auction, at the Court House, in Lexington, Va.,

On Monday, 3d day of February, 1873,

at 12 o'clock, M. of that day, for the term of three years from that date, that valuable

CHARCOAL IRON FURNACE,

now in successful operation in Amherst Co., Va., of the estate of Sam'l F. Jordan, deceased, together with an excellent Iron Ore Bank, in Rockbridge Co., Va., in connection therewith by the James River and Kanawha Canal.

The property has been in operation for the last ten years, and has yielded great profits to its proprietors. It is rented now for the purpose only of facilitating the settlement of Mr. Jordan's estate.

This is one of the most valuable and profitable properties in Virginia. The furnace, immediately upon the bank of the James River and Kanawha Canal, is abundantly provided with timber for fuel immediately surrounding it, and has a never failing water-power of the entire James River. Its capacity is 8 tons of iron per day.

It is 22 miles above Lynchburgh, and 112 from Richmond, by the canal.

The **Ore Bank** is also located upon the canal, 15 miles above the furnace. The ore is now raised about 90 feet, the opening is about a mile from the canal, to which a good wagon road leads down grade all the way.

The ore is of an excellent quality—50 per cent.—and is, perhaps, the finest in Virginia, being in great repute in Richmond, Baltimore and Philadelphia for the manufacture of car wheels.

Parties desiring to examine will best reach the property from Lynchburg. Mr. Wm. Jordan, the present manager, living at the Furnace, will take pleasure in showing the property.

Upon the next day, after the renting of the Amherst Furnace, will be sold all the stock and plant upon the premises, used and necessary for operating the same, consisting of mules, horses, wagons, carts, tools, canal boats, &c.

TERMS OF SALE.

For personal property made known on day of sale. For the real property, cash sufficient to pay costs of suit and renting, the balance in 6 equal semi-annual instalments, secured by bonds with good personal security, the lessee being required to enter into the usual covenant not to waste or damage the freehold. In case that part of the canal used in operating the furnace is at any time so seriously injured as to necessitate an abandonment of the operations, the lease may be abated *pro tanto*.

For further particulars, address

RICHARD L. MAURY, BOLIVAR CHRISTIAN, } *Com'rs.*
LEXINGTON, Va.

For Sale, &c.

Valuable Iron Works For Sale in Frederick County, Maryland.

The undersigned offers for sale until February 20, a valuable property, situated in Western Maryland, on the line of the Western Maryland Railroad, within a half mile of the Borough of Mechanicstown, containing ten acres of land, with a valuable Forge for the manufacture of Hammered Iron from Scrap, in running order, excellent water power with a fall of seventeen feet, beside a large and commodious dwelling house in good condition, a barn and other buildings. Situated in a fertile and prosperous country, with scrap in abundance, a constant demand for the iron, and railroad facilities excellent. A splendid opportunity is offered for a lucrative iron business. A very small capital is required for a successful prosecution of the business. Will be sold low and on easy terms if applied for promptly. Title good and possession given immediately. For particulars apply to or address **J. M. Wiestling,**
No. 203 Walnut Street, Harrisburg, Pa.

FOR SALE

The Napanoch Blast Furnace, Ulster Co., N. Y. Splendid water power. Charcoal and Anthracite Coal in abundance, cheap. Apply to **H. Bange,**
34 Tompkins Place, BROOKLYN, N. Y.

Special Notices.

Wanted.

By a practical man, 30 years' experience, a situation as a Charcoal Lumper, working with scraps for wire and other different purposes. Would have no objection to turn his hand to work at the forge rolls or to heat for a 12 or16 inch rolling mill. Good references will be produced. Address B. C. D.,
Post Office, Ansonia, Conn

File and Steel Trade.

The advertiser, who has had a long experience with a prominent firm, who, since the fire, have decided to discontinue their Retal Business, desires to make arrangements to represent a good house in Boston, and work the New England States, &c. Address
AGENT, Box 1628 P. O., Boston.

Steel and File Agency.

A first-class Sheffield House desires to meet with an old established firm, having a store in New York, to act as Sole Agents for the sale of Steel and Files in the United States.

Address, stating full particulars, Box 1631, New York Post Office.

HORSE SHOE IRON

Of superior quality,

MANUFACTURED BY

NEW HAVEN Rolling Mill Co.

R. T. HAZELL, AUCTIONEER.

By R. T. Hazell & Co.,

Store No. 118 Chambers Street.

Our REGULAR SALES of HARDWARE, CUTLERY, FANCY GOODS, &c., will be held on TUESDAYS and FRIDAYS throughout the season.

CASH ADVANCES made on CONSIGNMENTS without additional charge.

ALWAYSCOOL Stove Lid Lifter.

Ventilated Handle Manufactured by
G. B. WALBRIDGE, 55 Chambers St. N. Y.

Damaged Steel.

Wm. Jessop & Sons,

134 North Street, Boston,

Have for sale several hundred tons of Steel damaged in the late fire. Pay us a visit, Prices to suit all.

Trade Register OF HARDWARE

And Kindred Interests.

1873.

GUARANTEED CIRCULATION.

Five Thousand Copies,

Amongst all good standing Hardware Dealers throughout the United States, *payment for advertisements being required only upon proof of fulfillment of our Contract.*

Will be published about February.

All Parties having anything kindred to Hardware should advertise in it.

Circulars upon application.

The Merchants & Man'frs Agency,

4 Warren St., N. Y., Publishers.

CAUTION.

The public are warned against paying money in advance for the insertion of advertisements, or other matter in works published by us.

The Merchants and Manufacturers Agency,
4 Warren Street, N. Y.

NOTICE.—THE FIRM OF WILLIAM & HARVEY ROWLAND, Manufacturers of Springs and Steel, will be continued as heretofore, the heirs of WM. ROWLAND representing the interest of Wm. Rowland, deceased, as provided for by articles of agreement made January 1, 1868, providing that in case of death of either of the partners prior to January 1, 1878, the copartnership should continue for ten years from the first day of January, 1868, with a further provision for its extension for one year, namely, January 1, 1879.

The interest subsequently given to EDWARD ROWLAND, son of William Rowland, and to WILLIAM ROWLAND, son of Harvey Rowland, will remain as heretofore. HARVEY ROWLAND,
Surviving Partner,
No. 948 Beach Street, Philadelphia.
December 27 1872

The Iron Age.

New York, Thursday, January 16, 1873.

DAVID WILLIAMS . . . Publisher and Proprietor.
JAMES C. BAYLES . . . . Editor.
JOHN S. KING . . . Business Manager.

The Iron Age is published every Thursday morning, at No. 80 Beekman Street, New York, on the following terms:

SUBSCRIPTION.

Regular Weekly Edition...$4·00 a year.
Semi-Monthly..... 2·00 "
1st and 3d Weekly Nos. in each month.
Monthly..... 1·00 "
1st Weekly No. in each month.

ADVERTISING.

One square (12 lines, one inch), one insertion, $2·50; one month, $7·50; three months, $15·00; six months $25·00; one year, $40·00; payable in advance.

All communications should be addressed to
DAVID WILLIAMS, Publisher,
80 Beekman St., New York.

City Subscribers will confer a favor upon the Publisher, by reporting at this office any delinquency on the part of carriers in delivering *The Iron Age*: also, the loss of any papers for which the carriers are responsible. Our carriers are instructed to deliver papers only to persons authorized to receive them, and not to throw them in hall ways or upon stairs; and it is our desire and intention to enforce this rule in every instance.

CONTENTS.

Senator Buckingham's Banking Bill.

The National Association of Iron Manufacturers, at their meeting in Philadelphia last week, adopted the following preamble and resolution:

Whereas, A bill has been introduced before the United States Senate by Senator Buckingham, of Connecticut, having for its object the establishment of a free banking system based on United States bonds as security, under proper restrictions; and,

Whereas, The necessities of the country, with all its industries, require an increased currency; therefore,

Resolved, That the National Association of Iron Manufacturers, representing the iron industry of the United States, highly approving of the establishing of a free and liberal banking system, based on bonds of the United States as security, urges upon Senators and Representatives from all parts of the country to sustain and forward any well considered movement looking to this end.

The following is the full text of the bill referred to, which is entitled "A bill supplementary to an act entitled, An act to provide a national currency secured by a pledge of United States bonds, and to provide for the circulation and redemption thereof, approved June third, eighteen hundred and sixty-four, and to secure an elastic currency, to appreciate national obligations, and to reach specie payments without commercial embarrassment:"

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled:

That the act entitled "An act to provide a national currency secured by a pledge of United States bonds, and to provide for the circulation and redemption thereof," approved June third, eighteen hundred and sixty-four, be, and the same is hereby declared to be, open and free for banking, and any and all persons are at liberty to organize banking associations at such places as they shall judge proper in accordance with the provisions of said act, and of other acts relating to national banking associations.

Sec. 2. That all banking associations are prohibited from paying interest, directly or indirectly, on any and every description of deposits. The reserve which banking associations are required to hold, under the provisions and conditions of the act to which this is supplementary, may include such United States bonds as bear interest payable in coin, as well as lawful money of the United States. All banking associations shall redeem their circulating notes at such localities as are now, or may be hereafter, designated by law, either in coin, or in United States legal tender notes, or in United States interest-bearing bonds, at par, with accrued interest, at the option of the associations.

Sec. 3. That United States legal tender notes in sums of one thousand dollars and its multiple shall, on demand by the holder thereof, be redeemed by the Treasurer of the United States, either with coin or with United States bonds, the principal of which shall be payable on demand in legal tender notes, and the interest on which shall be payable semi-annually, in coin, at the rate of three and sixty-five one-hundredths per centum per annum, at the option of the Treasurer; and the principal of any United States bonds bearing interest payable in coin shall, on demand of the holder thereof, be paid by the Treasurer of the United States in legal tender notes, and the interest in coin. All bonds issued under the provisions of this act shall be free from State and municipal taxation.

Sec. 4. That it shall be the duty of the Secretary of the Treasury to issue bonds, as herein described, of denominations not less than one hundred dollars, and legal tender notes in denominations not less than five dollars, and to make all rules and regulations necessary to furnish proof of the lawful issue of such bonds and notes, and all that may be necessary to execute the provisions of this act.

The fact that so intelligent and influential a body as the National Association of Iron Manufacturers' have seen fit to pass a resolution that will be generally considered as an approval of this bill, will doubtless insure it a more careful and prompt consideration, than it would otherwise have received. It also gives the bill an interest for merchants and manufacturers, especially the classes included among our readers, which few bills of this character, previously introduced, have possessed. That it will be found, upon critical examination, to merit approval at all, we do not think probable.

The most noticeable feature of the bill, is that it does not seem to realize in any sense the magnificent promise of its title, *i. e.*, free banking, an elastic currency, an appreciation in our national obligations, and specie payments without commercial embarrassment. For example, the first section provides that any and all persons shall be at liberty to organize banking associations, upon compliance with the provisions of the existing laws. This privilege is open to the public already, since those who comply with the laws of Congress, relative to banking, can organize such associations whenever and wherever they see fit. We do not see, therefore, that Senator Buckingham's bill makes banking any more "free" than it is now. As it reads, this section does not mean anything more than that those who may wish to start national banks may do so, by complying with the law under which all existing national banks have been organized.

Section 2 of the bill prohibits the payment of interest on deposits by national banks. The idea underlying this prohibition is, that the payment of 4 per cent. interest by New York banks on the deposits of the country banks, attracts such deposits to New York. It is believed in Boston and other cities that, if the New York banks were forbidden to pay interest, these deposits would be made elsewhere as well as here. This is a mistake. The 4 per cent. interest is not offered to attract to New York the money which would come here in the natural course of business, but merely because of the competition between the banks seeking to be made the depositories of the funds placed here by the country banks to be drawn against as necessary. By prohibiting the offering of such inducements by the national banks, Congress would open the business to the competition of private bankers, who would offer interest enough to attract these deposits away from the national banks. The effect of this transfer would be that depositors would be exposed to greater risk of loss, and the private bankers would be more apt to loan such funds for speculative purposes on doubtful security, than would the national banks now holding them. These deposits would be made here under any circumstances, and Boston, Philadelphia and other cities could gain no possible advantage from such a change, while the country banks would unquestionably suffer by it. We admit that the payment of interest on deposits is inexpedient, and that it would be better if the banks should agree not to allow it; but the evil is one for which Congress is not competent to prescribe a safe remedy.

The second clause of Section 2, which allows the banks to include in their legal reserves all United States bonds bearing interest in coin, certainly merits approval. Not so, however, the provision which permits the redemption of national bank notes in United States bonds at par with accrued interest. This would give the banks an unfair advantage over the holders of notes presented for redemption, since they might redeem the same in bonds bearing the lowest rate of interest which Congress might see fit to issue for funding purposes—a most dangerous provision, and one which should certainly be stricken out. Banks conducted on a sound basis, and whose credit is good, do not need to redeem their outstanding notes in any other way than by receiving them in settlement of debts due them.

Section 3 proposes an artificial and impracticable means of relieving the money market in seasons of stringency, by making legal tender notes interchangeable at the United States Treasury with bonds bearing interest at the rate of 3·65 per cent. payable semi-annually in coin. The theory is that, when money was superabundant, the holders of legal tenders would rush to the Treasury, or the Sub-treasuries, to exchange them for bonds, thus making the government pay interest on all the unemployed money in the country; and that, when money was wanted, they would rush back with the bonds and exchange them for legal tenders, to use or loan. That such a system would tend to "regulate" the money market is, we think, a delusion. The only ones benefited would be the banks and money lenders, with considerable amounts of legal tenders to exchange, since they could be sure of 3·65 per cent. interest on their money, and could, therefore, afford to defer converting their bonds into legal tenders until rates were high enough to make it worth their while to do so. In the meantime the government would be paying interest on money for which it has no use, and which it must keep at all times on hand to redeem its 3·65 per cent. bonds at sight.

Taken as a whole, Senator Buckingham's bill is a disappointment. It promises what it does not give, and seeks to accomplish by artificial means what would be most easily and certainly accomplished by the removal of legal restrictions upon the expansion of bank credits. All that we need to make the money market truly self-regulating and our currency truly elastic, is to make banking free on the simple and sound basis of a deposit of United States 5 per cent. bonds to secure circulation, and give the banks absolute discretionary power in expanding or contracting their credit operations. It was doubtless on the supposition that Senator Buckingham's bill proposed these reforms that it met with such indirect approval as it received at Philadelphia, but we cannot believe that, had it been carefully examined, it would have been approved at all. Business men, not accustomed to the study of questions of financial policy, are often more impressed with the title of a bill than with its text; and we prefer to think that, in the present instance, what the National Association approved was what should have been the provisions of Senator Buckingham's bill, rather than what it actually does provide.

Our Local Building Laws.

Governor Dix, in his message to the Legislature, calls attention to the necessity for a stricter enforcement of the building laws in the following language:

The conflagration of large portions of the cities of Chicago and Boston, involving an immense sacrifice of property and the loss of many lives, suggests the necessity of revising existing laws in regard to the construction of buildings and the deposit of combustibles within our principal cities. It is due to the security of property and life that the provisions of law in respect to both should be of the most stringent character. Under the existing law, the Superintendent of Buildings in the city of New York is authorized to modify its requirements, with the consent of the Supreme Court. It is not to be expected that the members of this body, from the nature of their functions, will be so competent to form a correct judgment in regard to the propriety of such modifications in special cases as others whose connection with the subjects of fire and insurance gives them to some extent the character of experts. I therefore recommend that no modification of the law prescribing the mode in which buildings are to be constructed shall be made without the consent of a board to be jointly constituted by the New York Board of Fire Underwriters and the Commissioners of the Fire Department, the first as having, beside their special knowledge, a large pecuniary interest at stake, and the other from their familiarity with the causes of conflagration and the best modes of contending with it. With these the American Institute of Architects might, perhaps, be advantageously united for the appointment of such a board as I have referred to.

The suggestions contained in the above paragraph certainly merit immediate legislative consideration. In some respects our building laws are all that they should be; in others they are defective in not prescribing certain reforms which experience has shown to be necessary; and if any benefit is to result from such laws, it is important that they should be as complete and specific as possible. Moreover, it is of the utmost importance that they should be strictly and impartially enforced, and the governor's suggestion as to the precautions needed to prevent such modifications of these requirements in special instances as may tend to endanger the safety of property, are practical and worthy of consideration. Experience has shown that in such matters as wooden mansards, wooden furnace flues lined with zinc or tin, wood encased steam pipes, &c., the law might be made more stringent than it is with advantage.

But there are certain well-defined limitations to legislation of this character, beyond which it is not safe to pass; and it is of the utmost importance that the Legislature should observe these limitations and not carry the work of revising the law so far as to make it the means of imposing heavy burdens upon private enterprise, without, in any material degree, reducing the danger of local or general conflagrations. It is very evident that we have yet to learn how to build fire-proof, and, what is more important, how to impart to buildings of cheap construction such qualities as will enable them to resist great heat from without, and impose effectual barriers to the spread of flames originating within their own walls. Every great conflagration seems to demonstrate more clearly the alarming fact that there is no material nor method of building that can stand the test of fire, and it is evident, under these circumstances, that the Legislature is not competent to prescribe by law the security which art and science have together failed to provide. Most of the systems of fire-proofing, applied or proposed, would add so much to the cost of buildings that comparatively few could afford to occupy them, either as dwellings or as places of business. Land is now so valuable within our city limits, and the demand for warehouse, factory and dwelling accommodations so great, that any increase in rents, or in the cost of holding improved real estate, would drive away business and population. The profits of trade are already figured on so close a margin that many branches of business formerly lucrative, now barely return interest upon invested capital with the most prudent and economical management; and laws which in their operations should tend to increase rents by materially adding to the cost of buildings, would at once discourage commercial and manufacturing enterprise, and, by driving away trade and industry, discourage building operations. It is evident, therefore, that the Legislature cannot safely venture the enactment of experimental building laws, and that the most it can do, with a proper regard for the progress and prosperity of the city, is to enact such laws as may be needed to prevent the erection within city limits of buildings of an especially dangerous character.

But the greatest and most serious danger likely to result from injudicious legislative action, is that the public would learn therefrom to look to the Legislature, rather than to individual effort, for protection against conflagration. Whatever the Legislature might do in its efforts to avert from New York the disasters which have befallen Chicago, Boston and other cities, within the past few years, we must remember that upon private vigilance, and the observance of those precautions which the law cannot require at our hands, we are dependent for safety. Building laws which should tend to relieve individuals of any measure of their personal responsibility, by appointing public officers to look after matters which should be left to those immediately interested, would be in themselves sources of greater and more constant danger than the evils which they are designed to remedy. Until the importance of guarding against fire on all sides is understood and appreciated by the public—by builders and owners, as well as occupants of dwellings and warehouses—we shall have no security against sweeping and disastrous conflagration.

The New Movement in the Anthracite Trade.

During the past week a great deal of anxiety has been felt, especially in Philadelphia, because of a rumor of a movement which, if successful, will result in making a great monopoly of the trade in anthracite coal. As nearly as we can learn them, the facts of the case are as follows: The Reading Coal and Iron Company, a new corporation supposed to be the Reading Railroad Company operating under another name, has been purchasing mining lands in the anthracite region until it has acquired possession or control of some 80,000 acres—enough, we are informed, to give it control of nearly one-half the product of the Schuylkill district. Thus fortified, the directors of the company have made overtures to the owners of independent colleries, looking to a consolidation of interests—the Reading Company offering to work the mines and ship the product, giving the mine owners a royalty of ten cents per ton on all coal taken out. What other plans may have been proposed we do not know, but it appears that the overtures of the company were refused, and that to compel them more favorable consideration the Reading Railroad Company proposes to retail coal in the Philadelphia market for so much under current prices as to ruin the small dealers, and cut off competition, so far as possible, at the mines. If by this or any other means they can consummate their scheme, it is believed they will considerably advance the price of coal in the markets they control, and it is in this prospective advance that the large consumers, iron manufacturers, users of steam power and others, discern cause for alarm.

How far the Reading Company may be able to carry out its scheme of organizing a great monopoly through its control of one of the most important channels of transportation, we do not know. The trustworthy information at our command is too meagre to enable us to form any opinion which we should feel justified in expressing, but it is probable that, so far as the Schuylkill region is concerned, the Reading Railroad Company will, sooner or later, monopolize both production and transportation, unless legislative action is taken which will render such a consummation impossible. Whether such action is necessary, or whether the evils threatened are of such a nature as to work out their own correction if left alone, are questions which merit the careful consideration of the legislature of that State. As the rule, we deprecate on principle any legislative interference with private enterprise, believing that monopolies cannot long exist in this country unless protected by legislation calculated to check and restrain competition; but the anthracite trade is an exception to this rule, and to guard against a really oppressive monopoly of production and transportation, the employment of exceptional means would be justifiable. The anthracite region is of limited area; large corporations, already tending toward consolidation, own the greater part of the coal lands, or of the coal in the lands; the facilities of transportation are all owned and operated by companies largely interested in mining operations of their own, and in cutting off the product of the smaller, independent collieries from market; and everything points toward the ultimate absorption of the whole business by a great consolidated monopoly, with vast capital and resources of all kinds sufficient to enable it to increase or diminish production, as may be necessary to control the markets and regulate prices. To avert this possibility, by checking all movements tending in that direction, is a duty which the State of Pennsylvania owes not only to the country at large, but to those engaged in the work of building up her own great productive industries. The national prosperity is not dependent upon anthracite, and we could do without it, if necessary, but it is a fuel of great and increasing utility, and as such it should be so protected that, while mining enterprise and the construction of new outlets find the largest encouragement, great and oppressive monopolies will be impossible.

The reports of the majority and minority committees of investigation, appointed by the directors of the New York and Brooklyn Bridge Company, make a better showing of the affairs of that corporation than was expected. The only irregularity discovered was the payment of $125,000 as salary to Mr. Superintendent Kingsley, who, as chief private stockholder, has had practical control of the management of the company's finances: but as that gentleman refunded $50,000 of the amount received by him, and has served without compensation for nearly a year, there is no occasion to find fault with his present relations with the company. All materials used appear to have been purchased at reasonable prices, and although some of the contracts were awarded to the firm of Kingsley & Keeney, the committee discover no reason to think that the company's interests have suffered thereby. But from the state of things indicated by the report, it is evident that the management is in many respects essentially defective, in that the interests of the people are not in any way represented in the Board of Directors. As New York has subscribed $1,500,000 and Brooklyn $3,000,000 of the company's stock, it is scarcely proper that the financial management of the enterprise should be left wholly to the individual stockholder, whose aggregate subscriptions amount to only half a million dollars. There is, in this arrangement, altogether too great a chance for fraud and mismanagement to pass without further notice, and that there have been so few irregularities in the past offers no guaranty that, under the same system, there would not be the grossest corruption in the future. The interests of the taxpayers of New York and Brooklyn demand that the recommendation of the majority report, to the effect that the company's charter be so amended as to secure the proper representation of the two cities in the direction, be promptly acted upon by the legislature. The work has made good progress during the past year, and the stone towers are looming up into magnificent proportions, especially the one on the Brooklyn side.

The Fifth Annual Congress of Trade Unions assembled at Leeds, on the 13th instant, to continue in session one week. The following is the programme for the Congress: (1.) Examination of credentials, election of officers, and Chairman's opening address. (2.) Legislative action; Report of Parliamentary Committee on Mines Regulation Bill, Arbitration Bill, Compensation Bill, Truck Bill, Factory Nine Hours Bill, and the Criminal Law Amendment Act, and the Standing Orders for future Congresses. (3.) Future legislation: Criminal Law Amendment Act, Truck Bill, Factory Hours Bill, Compensation Bill. (4.) Questions for papers and discussion: Trades Societies—their necessity, objects, and usefulness; Trades Councils—their necessity and utility. (5.) Reduction of the hours of labor; limitation of overtime; apprenticeships; piece work, as it affects workmen, employers, and the public. (6.)

Foreign competition, and the introduction of foreign labor—their effects on British industry; emigration and unemployed labor; convict labor, as it affects certain trades. (7.) Co-operation, and industrial partnerships. (8.) Representation of labor in Parliament—the best means to secure it. (9.) How can the surplus funds of trades' societies be best utilized for general benefits; trades' halls, their adaptability and advisability for the purposes of trades' societies. (10.) The application of arbitration and conciliation in trades' disputes. (11.) The necessity of providing a sufficient staff of efficient and practical inspectors to enforce the Factory and Workshops Regulation Acts. (12.) Friendly societies and probable legislation thereon, as a result of the Friendly Society Commission. (13.) The employment of women and children in agriculture, factories, and workshops; and the employment of soldiers in industrial trades and agricultural labor. The delegates to this Congress evidently consider themselves members of a high commission empowered to regulate the affairs of the United Kingdom, and why they should care about representation in Parliament, when they can organize Congresses of their own with such programmes as the above, we cannot imagine.

Two very important railroad movements are on foot, which show how the solution of the question of cheaper freight transportation will ultimately be secured, without any governmental interference with private enterprise. The New York Central Railroad Company proposes to lay, in addition to its present double track, two additional tracks; thus making four tracks, two of which will be devoted to passenger travel exclusively, and two exclusively for freight. With these facilities the Central will become in part a freight railroad, and the saving in both time and expense in the moving of freights will sooner or later, in proportion to the activity of competition, be felt in permanently lower rates, and a larger freight movement. Of equal importance is the proposed change in the Erie gauge, by which the cost of operating that road will be greatly reduced, and its opportunities of successful competition with the Central materially improved. In a few years, at the furthest, this line, and the Pennsylvania Central, must follow the example of the N. Y. Central in quadrupling their track accommodations; and with the completion of roads now in progress, and the construction of others proposed, there is no reason to fear that the facilities of transportation will not be ample to meet all the requirements of commerce, and the competition of new and old lines sufficiently active to insure the adoption of the lowest tariffs at which freight can be profitably moved under the most economical and prudent system of railway management.

Scientific and Technical Notes.

The *Gorni Journal*, of St. Petersburgh, gives some interesting notes on the

PRODUCTION OF GOLD AND PLATINUM IN THE MUSCOVITE EMPIRE,

from which we take the following: In 1868 were produced (in 993 gold stream works, by 56,261 men, from 14,365,550 tons of gold sand) 56,068 lbs. of gold, the raw sand yielding 0·000195 per cent. on an average. The greater part was washed in Eastern Siberia, where the richest stream works exist. At the government gold diggings, or stream works, near Miask, in the district of Stataoust, the gold bearing stratum of sand is about 2½ ft. to 3 ft. thick, covered by 15 feet of dead gravel. The uncovering of the bed and the delivery of the gold sand to the washing establishments is generally done by contract and by the cubic fathom. The raw material is first screened in a stream of water, when the small parts flow through ¾ in. sieves upon buddles with transverse wooden lathes, behind which the gold particles principally collect. Every 6 or 12 hours, according to the produce of the sand, the lathes are removed and the tables washed clean with scrapers, brushes, etc., of this concentrated material, while larger lumps of gold are collected upon the screen from between the larger pebbles. At the larger works the extraction of the metal from the concentrated sand is done by steam-power, when the sand is washed through a fine sieve upon a buddle with American frame, where the stuff is still more concentrated, and finally finished upon hand washing machines. When the raw sand contains much clay or loam, perforated rotating drums are used instead of simple screens. The washed gold generally contains 10 per cent. of silver. Where only hand-power is used 40 men will wash in 10 to 12 hours 40 to 60 tons of sand, while with the use of machinery 150 men and 50 horses will wash 8 or 10 times that quantity. The greatest and most productive gold fields of Russia will always be those of Siberia. Platinum is always washed together with gold, and the production of raw platinum rests finally upon a separation from gold, with the exception of a single locality. The mixture of gold and platinum which is brough to Tagilsk is classified in two sorts. Both are treated with mercury when the gold is dissolved, while the platinum is left as a residue, which is separated from the amalgam by washing. The latter is pressed through a leather bag, and the gold obtained by distilling off the mercury. The raw platinum is by no means clean, but some samples contain, after M. Le Play, other metals, such as platinum, 75·1; palladium, 1·1; rhodium, 3·5; iridium, 2·6; osmium-iridium, 0·6; osmium, 2·3; gold, 0·4; copper, 1·0; iron, 8·1; residue, 4·5. The raw platinum is generally sold to England and France at a price of £15 per lb. platinum. The production of this metal was from 1828 to 1845, 5247 lbs. on an average, and is now 4000 lbs. per annum.

Professor Akerman, of the Polytechnic Institution of Stockholm, and Professor Tunner, of the mining school of Leoben, in Austria, have published their views on

THE INFLUENCE OF THE HOT BLAST

in the blast furnace. Akerman contends that the great increase of temperature, and consequent economy of fuel, is chiefly attributable to the circumstance that the heat, which is carried by the blast into the furnace, as compared with that created by the combustion of the fuel, is introduced therein without increasing the volume of gases, as a greater bulk of expanded gases escaping at the furnace top will naturally carry a greater amount of heat with it. Seeing, however, that blast of only 350° to 450° Fahr. will cause an economy of 25 per cent. of fuel against cold blast, Tunner asserts that beside the actual quantity of heat which the blast carries with it, its favorable influence must be looked for in the fact that it facilitates a rapid and complete combustion of the fuel, forming carbonic acid only, which again is not so easily to be reduced into carbonic oxide as Akerman and Bell seem to take for granted. While Akerman is of opinion that for producing white forge pig the temperature of the blast should not be raised over about 500° Fahr., it is claimed that in Styria white and mottled pig iron are constantly produced with hot blast of over 900° Fahr., when the burden is only fluxed with somewhat more lime, the pressure of the blast diminished, and the crucible widened to some extent. The Wasseralfingen system of horizontal and elliptical heating pipes utilizes the heat of the stove better than vertical pipes, as the cold air during its passage through the heating stove comes in contact with pipes of ever increasing temperature until it goes to the blast furnace; the absorption of heat being much more perfect when the pipes have a proper width in their greater diameter, so that the blast gets time to take up heat from their inner surface, when the stove is sufficiently high and wide to allow of a perfect mixture and combination of the air and the heating gases. It is evident, when the cold blast enters the heating apparatus at its coldest, and leaves it at its hottest part, that its temperature will be always somewhat less than that of the pipes which it passes; that it consequently is in a still fit state for taking up heat from the latter. As cast iron pipes will limit the degree of temperature which is obtainable, through their own fusibility, the Siemens regenerative principle has been also applied for heating blast. The Cowper apparatus seems to be more liable to become choked than that of Whitwell, which requires cleaning only once every three months. The latter was lately materially improved by enlarging considerably its compartment, and although its surface of contact was materially lessened, the temperature obtained was much greater, owing to the better combustion and the increased delay of the gases in the widened chamber. Though the regenerative system offers many advantages over the pipe system, it has not found much favor with Continental iron works, because it requires a large area, and is not so easily controlled and repaired as the latter.

Mr. B. T. McCarty, of Cleveland, Ohio, has invented a new

METHOD OF CONSUMING COAL SMOKE,

which promises to admit of useful application. He was looking after means to secure a better draft for a sluggish fire, and the idea occurred to him, after other devices failed, to try the effects of steam. A small pipe was made to conduct the "dry steam" from the top of the boiler to the upper part of the furnace, where it entered in two small jets, striking downward on the burning fuel. No sooner was the steam injected into the furnace than the sluggish, smoky fire sprang up into a clear, bright, yellowish and intensely hot flame, filling the whole furnace with a loud roar. The end sought—a strong draft—was attained, and, in addition, the long sought desideratum of a smokeless fire. This simple apparatus was next applied to the furnace of the Cleveland *Herald* printing establishment, and that journal gives an interesting account of the result. It says: "The smoke stack that had long been a nuisance to ourselves and our neighbors, was instantly as innocent of smoke as a deserted house, and so it has continued, save when the steam has been turned off for the sake of experiment and comparison." The proprietors of the *Herald* claim a saving of 25 per cent. in fuel when steam is admitted to the furnace.

Steam Plowing.

BY JAMES A. WHITNEY, M. E.

Steam plowing, like machine type-setting, has failed, not because of any mechanical obstacle in the way of merely doing the work, but because of its greater cost than old-time methods. The success of English steam plowing is vaunted, but while some accounts speak of large companies owning many plows and engines to work them and tilling the land at a stated price per acre throughout large districts, some travelers have recently asserted that in the course of long journeys in the agricultural sections of England, they have not found a single steam tilling machine in operation. From the best available data the truth seems to be that on certain stiff and heavy lands, where animal power is almost inadmissible, the steam plow has been largely used, and with most advantageous results, while, on the other hand, ordinary horse-drawn implements doubtless hold their own among tenants whose means, or business enterprise, is of course much less than that of the wealthy landholders, who, in many cases, appear to have taken the lead in adopting, or, at least, in testing, the use of motive power in tillage.

The steam plow is pre-eminently an English invention, and scores of projects were brought forward before anything practical was arrived at. The earliest of these date back two hundred and fifty-four years, for to nothing other than a steam plow could an invention "to ploughe grounde without horse or oxen" refer. Among other schemes have been steam vehicles for drawing the plows, pushed along by propelling legs. There was also suggested a carriage, consisting of a timber cylinder or drum, forty feet in diameter, and made hollow to receive an engine, by which it was to be rotated over the ground. The endless track, to be automatically laid down in front of the carriage and taken up in rear of it, is an old plan that has often been revived and revamped, and from one of the most sanguine of its advocates has come to be known as the "Boydell" traction engine. Some very ridiculous modifications of this system have been proposed; for instance, a track, to be laid down as just indicated, and "consisting essentially of inflated bags of India rubber." Of more apparent utility, but thus far equally non-acceptable to practical men, are a legion of rotary diggers, vertical spaders, and tractions provided with spikes to secure a hold on the ground to give the traction requisite to the operation of the soil-stirring mechanism. The elastic tired traction engine was foreshadowed in several steam carriages (most of them existent on paper only), in which India rubber bands or metallic springs were applied to yield in contact with the ground, to afford an increased bearing surface. The use of metal for the purpose has manifestly too many objections to render it feasible. It would seem as if but little difficulty would be experienced in attaching a thick band of rubber to the periphery of a wheel, but, in fact, this was done only after the outlay of a very large amount of money. The means whereby the requisite conditions were at last secured were as simple as they were ingenious, and I shall have occasion to speak of them in detail further on.

The English systems in actual use abroad are too well known to need elaborate description. In one an engine at each side of the field draws a plow, by a strong wire rope, alternately from one side to the other. In another the plow is operated by a single engine, placed at one side of the area to be plowed, and with its wire rope making the circuit across the field on supporting pulleys and drums back to the engine. The plow comprises two gangs, arranged upon opposite ends of a frame, suspended on a wheeled axle, in such manner that when advancing in one direction the frame may be tilted to bring one gang into the ground, and *vice versa*. This was the earliest in origin of all the salient features of modern steam tillage. It was first proposed for use in the province of Guiana, in South America, where the sugar growing lands are intersected by broad parallel ditches or canals. A boat or "punt" was to be placed on the canal at each side of a field, each craft carrying an engine with a winding drum. From the drum of one engine to that of the other extended a rope to which the plow, constructed substantially as just described, was to be attached. By drawing the rope to and fro a corresponding movement was of course given to the plow. As soon as one series of furrows was turned by the gang, the two boats were pushed along far enough to bring the plow upon a new "land."

The rotary digger, the spader, and the traction steam plow have all furnished examples in this country; but, according to the best available authority, have, with the possible exception of the elastic tire, proved futile. The Locker steam plow, a California invention, comprised a steam carriage with wheels five feet in diameter and three foot face, and carrying in rear of the mainframe a vertically adjustable horizontal shaft. Radiating from this shaft were a number of mold-boards, shaped like those of an ordinary plow, except that they were carried on a circle of two feet radius concentric with the shaft. These mold-boards were furnished with shares, and rotating in the same direction with the wheels, dug up the earth and finely pulverized it. Much was claimed in behalf of this apparatus, but in San Francisco, about two years since, I inquired about it, and was told that it had been run up beside the road and left there. It was said that a second machine, on the same plan, but with added improvements, was being made in the East at that time, but I have heard nothing further of the matter. Four or five years ago there was exhibited, before the Polytechnic Association of the American Institute, a model of a spading machine. The spades were actuated by a cranked axle, and their downward and backward thrust as the wheeled, steam-driven carriage advanced, was designed to comminute the soil in imitation of an ordinary spade. It was stated that an apparatus on this system had been made and tried in Chicago with decided advantage, but as the plan has not come into use the failure of the experiment may be very justly suspected.

In the matter of traction engines drawing gangs of plows, the only one tested since the trial of the Fawkes' steam plow, a dozen or more years ago, is the elastic tired Thompson engine, so called, but which has been so modified as to differ very materially, and for the better, from its English prototype, the "pat" boiler being superseded by a vertical steel tubular boiler of much greater efficiency. The tires are thick, endless bands of homogeneous India rubber, covered externally with a jointed armor of transverse iron plates. The lateral development of the tire is prevented by flanges formed at the edges of the wheel, while the face of the latter is perforated with numerous small holes. The inner surface of the rubber bulges into these holes and thereby secures sufficient hold to keep the tire from slipping on the wheel under ordinary conditions of draft or travel. Should an inordinate strain be brought upon the tire, such as would rupture the tire if the latter were rigidly fixed to the face of the wheel, sufficient air is admitted through the holes to prevent perfect adhesion (by atmospheric pressure), and the slip thus allowed to the tire frequently saves it from serious injury. There seems to be a necessity, in every variety of steam plow, for some part designedly made so as to yield, in case of undue strain, in order to avoid more serious loss from breakage. It will be remembered that in the Fawkes' plow a steam carriage, drawing a gang of plows, and with a large traction drum in lieu of driving wheels, the plows were attached to their supporting frame by wooden pins intended to break under the application of any force sufficient to place any of the more important parts of the machine in jeopardy.

The rubber tired engine has been tested for plowing on many occasions. In one of the experiments, at which I was present, the engine drew a gang of seven plows, each cutting a furrow twelve inches wide. The work was well done until one of the drivers struck into an ant-hill and sank until the bottom of the ashpit rested on the surface of the ground. It required about half an hour to start again, when the work proceeded without further trouble. Liability to accident of this kind is the main drawback to the success, mechanically considered, of steam plowing by direct traction. But I am in hopes that some simple means will yet be devised to enable the engine to haul itself out of soft places. This done, a great step forward will have been secured. I must mention, however, some trials that would give a more favorable impression than that to which I have referred. In the stiff adobe clays of California the rubber tired steamer cut simultaneously seven twelve inch furrows traveling at the rate of two or three miles an hour. As the resistance to the plows increases rapidly with the depth of the furrows, I am disposed to think that direct traction plowing, if successful at all, will be so only in moderate tillage, say eight inches of tillage or thereabout. Where greater depth, say from sixteen to twenty inches, as in the sugar lands of the South, the English two-engine system will be the best, and this with the more recent practice of engines of thirty horse-power instead of ten. The expense of using this apparatus will be very great, but the accounts from the Magnolia plantation in Louisiana go far to show that the increased yield will much more than pay the expense, the steam plowed land yielding two thousand pounds of sugar per acre against eight hundred pounds per acre from that tilled by horses in the usual way.

Proceedings of the January Convention of the National Association of Iron Manufacturers.

The National Association of Iron Manufacturers held their January meeting in accordance with the provisions of the Constitution, at the Continental Hotel, Philadelphia, on the 8th instant.

The officers of the association are as follows:

OFFICERS OF THE ASSOCIATION.

JAS. I. BENNETT, President, Pittsburgh, Pa.
NATHAN ROWLAND, 1st Vice-President, Phila.
JAS. E. WALKER, 2d Vice-President, Troy, N. Y.
WM. E. S. BAKER, Treasurer, Philadelphia, Pa.
THOS. DUNLAP, Secretary, Philadelphia, Pa.

MANAGERS.

JAMES WESTERMAN, Sharon, Pa.
WM. MULLIGAN, Saugerties, N. Y.
O. WILLIAMS, Catasauqua, Pa.
CHAS. S. LYNCH, Boston, Mass.
A. J. DULL, Harrisburg, Pa.
O. W. POTTER, Chicago, Ill.
C. L. BAILEY, Pottstown, Pa.
GEO. L REIS, Newcastle, Pa.
C. B. HERRON, Pittsburgh, Pa.

Office, No. 341 Walnut street, Philadelphia, Pa.

The meeting was organized by the president, James I. Bennett, Esq., in the chair, and the roll being called by the secretary, members from most of the iron manufacturing States in the Union responded to their names. The business reports of the secretary and treasurer were read, and a large amount of association business transacted which is not of public interest. The Secretary read extracts from the Annual Statistical Report for 1872, which furnishes a great deal of information in regard to the progress of the iron industry in the United States for a series of years. Particularly noticeable in this report was the great increase in new furnaces and rolling mills during 1872. The report contains a very full enumeration of these, with their location, names of proprietors, capacity, etc. The totals, as tabulated, show the astonishing fact that there have been built, or commenced, in the United States during 1872 no less than 107 new blast furnaces, and that 33 more are projected for immediate construction. There have been 35 new rolling mills built, many of which are of large capacity, including several large rail mills, and 9 new mills are projected. Scarcely one of the existing works but has also in some way increased its capacity, while a fair estimate of the new and increased productive capacity of the United States, so far as the iron industry is concerned, will be not less than an addition of 35 per cent. for the product of 1873.

The statistical report traced the production of iron in the United States from the revolutionary war to the present date, and also gave highly interesting tables from the census of 1870, being advance sheets from the census office.

This report will be issued for general circulation during the present month, and contains matter of great value to the trade.

The feature of the meeting was the introduction of Mr. Samuel Danks, inventor of the Mechanical Puddling Furnace, which has attracted so much attention here and abroad. Mr. Danks addressed the meeting at length, giving his experience with the iron trade of England, and showing that, in spite of the efforts of interested parties, he had successfully introduced the furnace throughout England and in Scotland, while in France, Belgium, Austria, Sweden and Norway furnaces upon his system were being erected. Mr. Danks fully described the construction and working of his furnace to the meeting, after which he was submitted to a long series of questions, to which he responded freely.

More information was thus obtained as to the working of the Danks Rotary Furnace than has hitherto been made public, and the readers of *The Iron Age* will be furnished with the same, in another issue, through the courtesy of Mr. Dunlap, secretary of the association. The meeting tendered a vote of thanks to Mr. Danks for his courtesy, and subsequently elected him an honorary member of the association, "in view of the eminent services rendered by him to the iron manufacturers of the United States by his inventions and successful efforts in the line of mechanical puddling." Mr. Danks thus is the first honorary member of this association.

Resolutions were adopted urging upon the Centennial Commission the appointment of a commissioner to collect, classify, analyze and describe the ores of the United States, for exhibition at the Centennial Exposition of 1876, and also in favor of the system of free banking based upon United States bonds as security for circulation.

The members present expressed their belief that a fair and prosperous trade in all branches of iron would be done in 1873, without the very high prices of 1872, which, being in a great measure speculative, restricted consumption to a considerable extent.

Prices at present figures are likely to be firmly maintained, and a good demand for most grades of iron already shows itself.

The meeting adjourned at 7 p. m., after a long session, at which a great deal of business was transacted and a vast amount of information interchanged in a harmonious and friendly spirit, and fully recognizing the benefits attained by associating themselves as in this body.

The Nail Manufacturers' Association.

On the evening of the 8th inst. the National Association of Nail Manufacturers held their semi-annual meeting at the Continental Hotel, Philadelphia. Mr. T. S. Blair, of Pittsburgh, president, in the chair.

Represented at the meeting were the following establishments: Providence Iron Company, Providence, R. I.; Boonton Iron Works, Boonton, N. J.; Oxford Iron Company, Oxford, N. J.; Cumberland Coal and Iron Company, Bridgeton, N. J.; Duncannon Iron Works, Duncannon, Pa.; Birdsboro' Nail Works, Birdsboro', Pa.; Pottstown Iron Company, Pottstown, Pa; Chesapeake Nail Works, Harrisburg, Pa.; Harrisburg Nail Works, Harrisburg, Pa.; Old Dominion Iron and Nail Works Company, Richmond, Va.; Sable Iron Works, Pittsburgh, Pa.; Juniata Iron Works, Pittsburgh, Pa.; Vesuvius Iron Works, Pittsburgh, Pa.; Clinton Iron and Nail Works, Pittsburgh, Pa.; Clifton Iron and Nail Works, Clifton, W. Va.

The secretary reported the usual statistics, giving a total product for the year 1872 of 3,800,000 kegs of nails.

Upon the adjournment a meeting of the Atlantic States nail manufacturers was held, with Mr. O. A. Washburne, Jr., in the chair. Questions of interest to the trade above were discussed.

The National Stove Founders' Association.

The National Association of Stove Founders will hold its annual meeting on the second Wednesday of February next, in Pittsburgh. This society was organized a year ago, and numbers about one hundred members at the present time. Since its organization, the association has been very useful in many ways, although its activity has been somewhat hindered from the fact that only a portion of the officers were elected at its last annual meeting. During the past year the work has mainly devolved upon Mr. Perry, the president, but at the coming meeting a permanent secretary will probably be elected, who will relieve the former officer of a portion of his onerous duties. The association is growing in strength and influence, and promises to be of permanent utility. Its office will be a convenient headquarters for the trade, where all information respecting prices, the movements and prospects of the trade, etc., may be obtained.

Louis De Coudres.—This veteran worker in metals, who died in Brooklyn on the 16th December, deserves more than a passing mention, from the fact that he assisted in building the machinery for the first steamboat launched in American waters. At the early age of 13 he was taken by James P. Allaire as his first apprentice—Mr. Allaire at this time carrying on a small brass and bell foundry. It was at this establishment the brass castings were made for McQueen, who had a machine shop and did the work for Robert Fulton, in applying his steam engine to the first paddle-wheel steamboat—the Clermont. Several years later, Mr. Allaire started his steam engine works in Cherry street, which became the leading establishment of the city, and famous over the entire country for the number and character of the engines it supplied to the first steamboats which navigated the waters of this continent. Mr. De Coudres continued with Mr. Allaire more than half a century, some of the time as superintendent of the iron foundry, and all of the time in charge of the brass casting department, in which art his reputation was pre-eminent. This branch of the Allaire Works possessed, for many years, almost a monopoly in the trade of bell casting. The first great fire-alarm bells put up in the City Hall Park were cast here by Mr. De Coudres. He was in his eighty-third year, and probably the oldest brass founder in this country.

Trade Report.

OFFICE OF THE IRON AGE,
WEDNESDAY EVENING, Jan. 15, 1873.

In our issue of December 26th we discussed at some length a scheme for relieving the money market, said to have found favor in the West. A correspondent writing from Chicago calls attention to an error in the wording of the bill as reported by telegraph, the correct reading being as follows:

I. To permit any holder of ten thousand dollars, or multiples thereof, in any of the gold-bearing bonds of the United States, to retire the same temporarily, at the sub-treasuries or designated depositories in New York, San Francisco, New Orleans, or Chicago, under regulations to be made by the Secretary of the Treasury, and receive an amount of United States legal tender notes equal to the face of said bonds temporarily retired; and upon presentation of a like sum in United States notes at the place where said bonds were temporarily retired, to receive the said bonds, or their equivalent in kind, less the interest which would have accrued during the time that the said bonds were temporarily retired. The converter or reverter of bonds as aforesaid, to adjust by payment in gold the value of the current interest at the time of conversion or withdrawal, whether the same be represented by coupons or otherwise, as may be provided by regulations established by the Secretary of the Treasury; and provided, further, that the Secretary of the Treasury be required to hold in reserve United States legal tender notes to the amount of forty millions of dollars ($40,000,000), to be used for the purpose of temporarily retiring United States bonds as aforesaid, but the said notes shall not be used for any other purpose, nor shall the whole amount of United States legal tender notes, including those which may be held in reserve and those which may at any time be held in the United States Treasury, sub-treasuries and depositories exceed four hundred millions of dollars ($400,000,000), until expressly authorized by law.

The objection to this scheme is that it would accomplish no results whatever. No one who wants either to borrow or lend currency has such bonds for conversion. The savings banks, as our correspondent suggests, have such bonds in considerable amounts, but there would be no inducement for these institutions to convert such securities, drawing say 6¾ per cent. interest, into greenbacks to loan at 7 per cent. Such schemes as this are worse than useless, since they divert attention from the real evils for which a remedy should be sought—the limitations placed upon banking operations by the law requiring the banks to maintain their reserves at 25 per cent. of their demand liabilities. This would practically release from fifty to sixty millions of dollars, and the abolition of the present "panic line" of the money market, would deprive the money lenders and note shavers of their only basis of operations for artificial stringency and high rates.

Since our last review, the Finance Committee of the Senate has submitted an able and exhaustive report on the authority of the Secretary of the Treasury to reissue, at his discretion, the greenbacks retired by Secretary McCulloch. The committee say that all the clauses of the somewhat ambiguous statutes which have been pointed out as giving support to Mr. Boutwell's view, are overruled by the intent of the act of 1866, and by the circumstances under which it was passed; that the act of 1866 directed the retiring of the notes in order to fund them, and the assumption of the power to reissue was not consistent with the direction contained in the law that the public debt should not be increased by the process. This decision may not give general satisfaction, but no one will deny that if the Secretary of the Treasury is to be allowed to increase the currency, his power to do so should rest upon something more than implication, or the absence of specific legal prohibition. The committee say:

"The full exercise of such a power would undoubtedly affect the nominal value of all property in the United States to the extent of at least ten per centum, and the real value or burden as between debtor and creditor of at least ten per cent. on all contracts to be performed in future. Such a power, if given, would be by clear and unambiguous language, and should not be inferred by subtle reasoning, or depend upon the pressure of interested parties, or changing views of public policy."

During the past week there has been a steady progress toward ease in money, both in this and the foreign markets. The rates on call have declined from 1-32 of 1 per cent. per day to 6 @ 7 per cent., and mercantile paper has advanced to 8 @ 12 per cent. The money market is without other important features.

The gold market has been strong, advancing somewhat, owing to the export of specie and the firmness of foreign exchange. The following shows the daily range of the premium:

	Highest.	Lowest.
Thursday	112⅛	112⅛
Friday	112⅛	112⅛
Saturday	112⅛	112⅛
Monday	112⅛	112
Tuesday	112⅛	112
Wednesday	112⅛	112

The stock market has been irregular during the week, and closed heavy. The principal dealings have been in Erie, Lake Shore, O. & M., W. U. Telegraph, U. Pacific and N. Y. Central. The highest and lowest of to-day's prices are given below.

The bond market has been dull and firm. The closing quotation of governments are given below.

In foreign trade the movements have been as follows:

IMPORTS.

	1871.	1872.	1873.
Tot. for week	$5,640,792	$6,249,201	$5,348,106
Prev. reported	....	....	....
Since Jan 1....	$5,640,792	$6,249,201	$5,348,106

Included in the imports of general merchandise for the week are:

Anvils	77	$712
Brass goods	25	4,710
Bronzes	22	2,876
Chains and anchors	4	187
Copper		37,088
Cutlery	154	35,422
Gas fixtures	1	318
Guns	23	3,493
Hardware	53	3,739
Iron, hoop, tons	42	2,244
Iron, pig, tons	1,513	43,937
Iron, sheet, tons	53	3,498
R. R. bars	8,654	122,249
Iron, cotton ties	831	2,926
Iron tubes	2,036	6,212
Iron, other, tons	840	32,753
Lead, pigs	11,007	62,640
Lead, tons	40	3,259
Metal goods	205	22,032
Nails	5	783
Needles	21	9,943
Old metal		6,448
Per. caps	10	2,046
Saddlery	6	1,516
Steel	4,503	57,161
Spelter	173,521	13,464
Tin, boxes	7,905	67,615
Tin, 2208 hhds.	187,129	52,351
Wire	1,094	14,742
Zinc	55,000	2,790

EXPORTS EXCLUSIVE OF SPECIE.

	1871.	1872.	1873.
For the week	$4,774,187	$2,209,953	$4,451,123
Pre. reported	4,187,739	3,199,209	3,513,906
Since Jan. 1	$8,961,926	$5,409,162	$7,964,329

EXPORTS OF SPECIE.

Total for the week	$2,695,233
Previously reported	....
Total since January 1, 1873	$2,695,233
Same time in 1872	$3,414

The bank statement shows an increase in the total reserves of $2,772,300, an increase in the total liabilities of 3,481,200, and an increase in the amount of lawful money which the banks now hold above the 25 per cent. requirement of $1,902,000. This amount now is $1,690,025. At the corresponding time last year the banks had $10,866,075 lawful money above the 25 per cent. requirement, and in 1871 $13,102,921. The following is a comparison of the averages for the past two weeks:

	Jan. 4.	Jan. 11.	Differences.
Loans	$277,720,900	$275,552,800	Dec. $2,168,100
Specie	19,478,100	23,539,100	Inc. 3,061,000
Circul'tion	27,613,800	27,461,600	Dec. 152,200
Deposits	203,808,100	207,441,500	Inc. 3,633,400
Leg. Ten	41,165,400	40,876,700	Dec. 288,700

Foreign exchange is quoted as follows:

	60 DAYS.	3 DAYS.
Prime bankers' sterling bills on London	109¼ @ 109⅜	110¼ @ —
Good bankers' do	109⅛ @ 109¾	110⅛ @ 110¼
Prime com. sterling do.	108¾ @ 109	@ —
Paris (bankers)	5·22½ @ 5·23¾	5·17½ @ 5·18¾
Antwerp	5·20 @ 5·21¾	5·15 @ 5·16¾
Swiss	5·18¾ @ 5·20	5·13¾ @ 5·15
Amsterdam	40⅝ @ 40¾	40⅜ @ 41⅛
Hamburg	24 @ 24⅛	24⅛ @ 24⅜
Frankfort	41¼ @ 41⅜	41⅛ @ 41⅜
Bremen	24 @ 24⅛	24⅛ @ 24⅜
Prussian thalers	72 @ 72¼	72¼ @ 73

Government bonds at the close were strong. We quote:

	Bid.	Asked.
U. S. Currency 6s	113¾	114
U. S. 6s, 1881, reg	115⅛	115⅝
U. S. 6s, 1881, c	115⅞	116⅛
U. S. 6s, 5-20 reg. May and Nov.	113⅞	113¾
U. S. 6s, 1862, c	113¾	114
U. S. 5-20 1864, c	114	114¼
U. S. 5-20 1865, c	114⅞	115⅛
U. S. 5-20 1867, r. Jan. and July	114¾	114¾
U. S. 5-20 1865, c. Jan. and July	113¾	113⅞
U. S. 5-20 c. 1867, " "	115	115⅛
U. S. 5-20 c. 1868	114⅞	115⅛
U. S. 10-40 reg.	110⅞	111⅛
U. S. 10-40 c	111	111⅛
U. S. 5s of 1881, reg	111¾	112¼
U. S. " c	111¾	112¼
Central Pacific Gold Bonds	99¼	99⅝

The following were the highest and lowest prices of stocks to-day:

	Highest.	Lowest.
N. Y. Cen. & Hudson Consolidated	102⅞	101⅞
Lake Shore	93	92⅛
Rock Island	111½	110⅞
Wabash	71¾	70¾
Harlem	115⅝	115⅛
Canton Land Co.	101½	101
Western Union Telegraph	84⅛	82⅝
Milwaukee & St. Paul	52⅛	52
Pacific Mail	71⅞	71⅛
Erie	62¼	60⅝
Ohio & Mississippi	47½	46⅝
Boston, Hartford & Erie	8¾	8⅝
Union Pacific	36⅞	35⅝
C. C. & I. C.	38¾	38½
Hannibal and St. Joseph	48	47
U. S. Express	79¾	79⅛

GENERAL HARDWARE.

Trade is quiet, and the chief interest in Hardware circles is in regard to the changes in price which have taken place or are expected. The surprising change in the Iron market which has taken place this week, must go far to counteract any feeling of weakness among manufacturers, where such feeling exists—of which we have had very little evidence, prices having been well maintained during the dullness of the past two or three months, notwithstanding the decline in Iron which was then taking place. While the course of the Iron market cannot yet be predicted with any degree of confidence, it would be little short of madness for manufacturers to sell goods for spring delivery at prices based on the expectation of cheap Iron. The leading manufacturers of General Hardware are now revising their prices, most of which have been determined; but the publication of the new lists has been delayed in each case by a few articles which are still undecided. Some of the makers of Casters are now in session for the purpose of revising list prices.

The makers of Pumps, at their meeting in this city, last week, revised lists and adopted new discounts. The list prices can only be obtained from the new price lists of the various manufacturers. On other matters, the following, which is the substance of "the quarterly circular of the Pump Manufacturers' Association of the United States," will give all needed information. Although dated the 8th instant, the circular was not issued till to-day:

The Pump Manufacturers' Association of the United States congratulate themselves and the trade upon the permanence and stability which have been given to prices by this organization during the past year, and feel assured that our patrons will regard the association with favor, as facilitating the handling of Pumps. In presenting our January Quarterly Circular, we desire to state we have made some changes in list prices, rendering all the similar goods of the several manufacturers uniform in price.

From and after this date the following discounts from the new list, (all old ones hereby being declared null and void) will prevail until further notice:

Iron and Brass Cylinder, Cistern and Pitcher Pumps ..... Dis. 25 per cent.
Well and Set Length and Drive Well Pumps, Iron Force Pumps and Hydraulic Rams ..... Dis. 20 per cent.
Garden Engines ..... Dis. 10 per cent.

On positive out-and-out orders for delivery in 60 days from date of such order, for $250 or more, net amount of invoice of Pumps, Rams, and Garden Engines (and no other goods except those mentioned in schedule of discounts, shall be included in making up this amount), the discount shall be 5 per cent. more, and the extra discount shall apply on all subsequent purchases to January 1, 1874.

On purchases of $500 or over at one time of above mentioned goods, on the same condition as named above, there will be an extra discount of 10 per cent. in lieu of 5 per cent., and the extra discount shall apply on all subsequent purchases of these goods to January 1, 1874.

The new price list of the Union Manufacturing Company is the only one which has yet reached us, and we print below the new prices on all the goods contained in their previous catalogue:

Fig. 1. Burr's Patent Cistern Pump. List price remains the same.
Fig. 2. Burr's Patent Side Ear Cistern Pump or Union Bolt Side Ear. List price remains the same.
Fig. 4. Union Bolt Cistern Pump—Eastern Pattern. List price remains the same.
Fig. 6. Gray's Patent Cistern Pump. List price remains the same.
Fig. 8. Burr's Patent Pitcher Spout Pump, No. 1, $4·25; 2, $4·75; 3, $5·25; 4, $5·75.
Fig. 9. Union Bolt Pitcher Spout Pump, No. 1, $4·25; 2, $4·75; 3, $5·25; 4, $5·75.
Fig. 12. Out Door Cistern Pump, with Cast Iron Set Length, No. 1, $5·50; 2, $6; 3, $6·50; 4, $7; 5, $7·50.
Fig. 13. Out-Door Cistern Pumps, with Wrought Iron Set Length, No. 1, $6; 2, $6·50; 3, $7; 4, $7·50; 5, $8.
Fig. 14. Pitcher Spout Out-Door Pump, with Wrought Iron Set Length, No. 1, $6·75; 2, $7·75; 3, $8·75; 4, $9·50.
Fig. 15. Deep Well Submerged Pump. List price remains the same.
Fig. 16. Yard Pump, with Wrought Iron Set Length, No. 1, with 2¼ inch cylinder, $8·25; 1, with 3 inch cylinder, $8·75; 2, with 3¼ inch cylinder, $10·50.
Fig. 17. Southern Yard Pump. List price remains the same.
Fig. 18. Yard Pump, with Cast Iron Set Length, No. 1, $8·25; 2, $10·50.
Fig. 19. Engine Yard Pump. List price remains the same.
Fig. 20. Base Hand Suction and Force Pump. Air Barrel with two discharges, No. 2, $11; 3, $12; 4, $13; 5, $14·50.
Fig. 21. Side Suction and Force Pump. Air Barrel with two discharges, No. 2, $11; 3, $12; 4, $13; 5, $14·50; same price without the Plank.
Fig. 20. Without the Air Barrel, No. 2, $9·50; 3, $10; 4, $11; 5, $12·50.
Fig. 21. Without the Air Barrel, No. 2, $9·50; 3, $10; 4, $11; 5, $12·50. Same price without the Plank.

Fig. 22. House Suction and Force Pump, mounted on Plank, with Guide Rod:

Iron.	Brass.	Iron.	Brass.
No. 2....$15·00	$25·00	No. 4....$16·50	$34·00
No. 3.... 15·75	28·00	No. 5.... 20·00	37·00

Not mounted on Plank, $1 less.

Fig. 23. House Suction and Force Pump, mounted on Plank, with Guide Rod and Air Barrel:

Iron.	Brass.	Iron.	Brass.
No. 2....$17·00	$26·50	No. 4....$18·50	$36·00
No. 3.... 17·75	29·50	No. 5.... 23·00	39·00

Not mounted on Plank, $1 less.

Fig. 22. Without Guide Rod, $1 less than above.

Fig. 24. House Suction and Force Pump, without Guide Rod and not mounted.

Iron.	Brass.	Iron.	Brass.
No. 2....$13·00	$23·00	No. 4....$14·50	$32·00
No. 3.... 13·75	26·00	No. 5.... 18·00	35·00

Single Hand Garden or Fire Engine.....each $25·00 including 3 feet Hose, Discharge Pipe and Sprinkler.

Blood's Scythes are put on the market this year at last season's prices. Among the new varieties we notice a Bramble Scythe, lighter than a Bush Scythe, which sells at $11. The Young America is a new style that sells at $10·50, and the Silver Clipper, a very superior article of silver steel, sharpened ready for use and nicely put up in boxes of 1 dozen. Price $12·63. From all these prices a discount is taken to the jobbing trade.

At a meeting of Nail Manufacturers, held in this city on the 10th instant, the card rates were reduced fifty cents, making the price for 10d. to 60d. $5 per keg, less 15 cents per keg for lots of 100 kegs and over, and 20 cents for lots of 1000 and over. At these rates the market may be quoted firm. In Philadelphia, while the card rates are the same, viz., $5, the discount for quantity has been fixed at 10 and 15 cents respectively. We learn that in Boston, the old rate, viz., $5·50 for 10d. to 60d., is still retained.

The following circular has been issued by the Blind Hinge Manufacturers:

JANUARY 10, 1873.

We, the undersigned, Manufacturers of "Window Blind Hinges," reduce the price from this date as follows: Regular discount from List, 30 per cent. For an order of 50 cases at one time, discount 35 per cent. Terms, cash 30 days from date of invoice.

CHARLES PARKER.
CLARK & CO.
WRIGHT, DANA & CO.
JOHN D. SHEPARD.

NOTE.—Each case, for wood, contains six dozen sets. Each case, for brick, contains four dozen sets. The above discounts apply to Surface Blind Hinges only.

The following are the present prices for Perkins' Finished (ready for driving) and American Pressed Horse Nails:

PERKINS' FINISHED.

No.	5	6	7	8	9	10	
	29	26	24	23	22	21	cents.

AMERICAN PRESSED.

No.	5	6	7	8	9	10	
	22	20	20	20	20	20	cents.

At a meeting of the principal Eastern manufacturers of Drilled and Wire Jointed Fast Cast Butts, comprising Blake Bros. & Co., Sargent & Co., of New Haven, and the Union Mfg. Co., of New Britain, Conn., with the assurance of the Ohio Butt Co., of Joliet, Ill., that they would "follow prices adopted by other manufacturers," the following list was agreed upon, to take immediate effect.

	Per doz.		Per doz.
1½ inch	$0·70	3½ inch	$1·55
1¾ "	·75	3¾ "	1·75
2 "	·80	4 "	1·95
2¼ "	·90	4½ "	2·50
2½ "	1·00	5 "	3·10
2¾ "	1·10	5½ "	3·90
3 "	1·20	6 "	4·70
3¼ "	1·35		

25 per cent. discount.

Parties whose net orders for Butts amount to $250 or more, for each six months ending June 30th and December 31st, will be entitled to an extra discount of 5 per cent. on net.

In addition to the former discount of 5 and 5 per cent., an extra discount of 2½ per cent. for cash is now given on Rowland's Shovels and Spades. Philadelphia Eagle Bolts were made last week discount 40 and 5 per cent. delivered in Philadelphia. The price here is discount 40 per cent.

Foreign goods are scarce and advancing. We quote English Coil Chain 9 cents, gold, for ⅜. The latest quotations for this size in England was 23/, an advance of 4/, or more than 20 per cent. from the lowest point reached before the advance.

In consequence of the pressure on our columns, our Review of the Hardware Trade for July, August and September last is crowded out this issue.

We have seen some pages of a handsome catalogue the Union Manufacturing Co. are preparing of their goods, which will be issued in a few weeks. In Pumps this establishment has added largely to their former variety in all styles, such as Brass and Iron Suction and Force, fancy Engine, Yard, Steam Boiler, Force, etc. In the line of Butts this catalogue will show the most complete assortment ever offered to the trade by one manufacturer, comprising Cast Iron, Cast Ornamental Enameled, Real Bronze, Nickeled on Iron and on Bronze, loose or fast joints, with or without caps, etc., in a great variety of sizes and styles.

The Connecticut Cutlery Company have shown us some of their new brand of Shears, of which the price is discount 60 per cent. These goods are very much superior to the ordinary Shears, and present a marked contrast to the goods lately made by the same company. They are heavier, and are well finished in every respect.

IRON.

American Pig.—The market hangs fire from the reluctance of makers to contract ahead and the almost utter indifference of the large buyers to take hold at over $45. A good deal of manœuvering is apparent on the part of the makers, in order to find the exact bearings of the market and to know the price at which to sell, and to have the market hold its own after they have made their contracts. Large contracts have been reported the past week, the statements varying from 100,000 to 150,000 tons, and although it is generally admitted that some favored buyers have been enabled to purchase for the season and half season delivery on a basis of $43 @ $44 for No. 2 Extra, and $45 @ $46 for No. 1, we find very few who entertain the opinion that the contracts aggregate anywhere near the amount rumored. From careful estimates, it appears that the Glendon has sold about 25,000 tons, the Crane about 20,000 tons, the Allentown about 12,000, and various other companies small lots, making an aggregate of not over 75,000 tons at the outside since the beginning of the season. The Thomas Co., it is said, have not sold any. The market is evidently firmer, however, and many of the companies are asking $48 @ $50 for No. 1, $44 @ $45 for No. 2, and $40 for Forge, though the trade is in such an unsettled state at the moment that it is difficult to arrive at exact valuations. There is not any stock of moment in companies' hands, it having taken them up to January 1 to close up last year's deliveries, and the few lots in second hands available for immediate delivery are held at various prices from $50, up. We hear of 50 tons No. 1 selling at $50. In the present condition of the market we cannot make definite quotations.

Scotch Pig.—Although the latest cable advices from the other side do not indicate any further advance in the price of Scotch Pig, they quote the market very strong and little if any change expected as long as the colliers and miners remain at issue with their employers. Importers continue very firm in their views, and not disposed to consider bids anything off from their ideas, and are placing their supplies in store. The market, therefore, presents a very quiet appearance, with transactions limited to the smallest possible amounts suitable for pressing requirements. We quote Coltness and Gartsherrie, $55; Glengarnock, $50 @ $52, and Eglinton, $48 @ $49.

Following are the prices of Scotch Pig Iron in Glasgow, as reported by Messrs. J. E. SWAN & BRO., under date of Dec. 27:

GLASGOW BRANDS.

	No. 1	No. 3	No. 4
Gartsherrie	140/	125/	....
Coltness	145/	127/6	....
Summerlee	135/	121/	120
Langloan	†145/	125/	....
Govan	124/	121/	120
Calder	*145/	121/	....
Shotts, Bessemer	160/	155/	....
do Ordinary	130/	125/	....
Carnbroe	130/	121/	120
Wishaw	125/	120/	115/
Monkland	125/	121/	....
Chapelhall	135/	121/	....
Clyde	125/	121/	....
Quarter—Clyde	125/	121/	120/

Glasgow Warrants 3-5, No. 1; 3-5, No. 3, g. m. b. 121/.

*f. o. b. Glasgow, 1/ per ton, extra.
† " " " 6d. " "

WEST COAST BRANDS—*f. o. b. Ardrossan.*

Glengarnock, Ardeer	135/	123/	....
Eglinton, Lugar, Muirkirk, Portland, Branded Eglinton	123/	120/	120/
Dalmellington	130/	120/	115/

CURRENT RATES OF FREIGHT ON PIG IRON.

To	From Glasgow.	From Ardrossan.
New York	15/	10/
Boston	20/	12/6
New Orleans	12/6	9/
Baltimore	20/	20/
Philadelphia	20/	15/
Providence	20/	15/

Bar.—The market continues quiet from same causes given in last issue, but prices are held very strong at fully late figures, the advices from abroad still favoring the selling interest. The city merchants met last week and agreed on $105 per ton as the rate from store. $100 is the price of the Eastern mills.

Old Rails.—The stock of Old English Rails is very light abroad, and of late has been further reduced by the sale of 40,000 tons to the Austrian government, to be used in the erection of the building in which the World's Exposition is to be held in the spring of 1873. The demand here has been light, but prices very strong, and at the close, with advices of a further appreciation abroad, many holders have withdrawn their offerings from the market. We note a sale of 400 tons Double Head at $55, 4 months, with interest. We quote now at $57·50, currency, for D. H.

Rails.—New Rails continue quiet, but firm at $73 @ $75, gold, for English, and $80, currency, for American at the mills.

Scrap—Is only moderately active, but prices very firm, owing to the higher figures abroad. It is thought that Scrap could not be laid down here, taking present prices abroad as a basis, at less than $51. We note sales of 600 tons at $50, and 100 tons No. 1 at $55, with holders generally asking at the close, $50 @ $55 from yard, though it is thought that stock could be had at $50 @ $52·50. There is little if anything doing from the dock, the bad carting interfering with trade, and prices somewhat uncertain.

METALS.

Copper.—American Ingot has been less active the past week, though a fair trade has been effected. Prices continue to advance, and still rule very firm, most dealers thinking that still higher figures will rule before the opening of navigation. The advices from abroad continue favorable. The transactions the past week have reached about 1,100,000 lbs. Lake at 34½c. @ 35c. cash, and 35c. @ 35½c. for future delivery, the market closing at the outside prices. English has been in active request, with sales of 200 tons Best Selected at 30½c. @ 31c. here and to arrive. Manufactured Copper and Yellow Metal continue firm at former prices. We quote: New Sheathing at 45c.; Bolts and Braziers, 45c.; Bronze, and Yellow Metal Sheathing, 27c.; and Yellow Metal Bolts, 30c., cash.

Tin.—The market for Pig Tin continues extremely quiet, and the absence of demand has rather a depressing influence on prices. We quote Straits at 31½c.; English, 31½ @ 31¾c.; and Banca, 30c., all gold prices. Tin Plates still show a good degree of activity, and holders are firm in their views at the late advance. We quote, I. C. Charcoal at $11 @ 11·50; I. C. Coke at $10 @ $10·25; Coke Terne, $8·75 @ $9·25; and Charcoal Terne, $10 @ $10·25.

Lead.—Importers have withdrawn their offerings from the market, as stock from second hand is being offered at 6⅜c., gold, which is ¼c., gold, less than present cost. Manufactured Lead is steady at 9¼c. for Bar, 10½c. for Sheet and Pipe, and 16½c. for Tin Lined Pipe, less the usual discount.

Spelter and Zinc.—Advices have been received of a further advance abroad in Spelter, and our market rules very firm in sympathy at a shade higher figures. The demand, however, is extremely light, and the quotation must be considered more or less nominal. We quote at 6⅞c. @ 7c., gold, for Silesian. Zinc continues steady from store at 10c. @ 10½c., with small lots selling from agents' hands at 8⅜c., net, gold.

The following is the review of the metal market, specially prepared for *The Iron Age*, by Messrs. THOMAS J. POPE & BRO.:

The movement of business is considered very satisfactory. Prices and confidence, except in Tin, gather strength with the advancing season. Transactions in metals, Tin Plates and Iron are large, and are being made by houses of great wealth, influence and knowledge of the course of trade and finance. In Europe the position of prices is still toward activity and advance, and the promise of the immediate future favorable. The abundance of money and activity of commerce in the Eastern world would indicate a fair and remunerative condition of prices for the cereals and cotton of the United States, and that trade will continue to favor the agriculture and manufactures of this country. Money here works with more ease, and during the spring and summer months, at least, business may be unchecked by any great stringency in finance, both here and in Europe. The advances in the prices of metals during the past year are really attributable to the following causes in Europe: The close of the German war with France settled for many years the question of European supremacy, and let loose the hoarded capital of previous years—hoarded, because of the threatening dangers of war—into fresh industrial and commercial channels. The experience of all late European wars demonstrating the necessity of complete railway systems for the concentration of offensive or defensive armies, led every nation in Europe to project and complete their strategic railway systems, in addition to the natural

progress of railways—and this created an enormous iron and metal demand for railway construction and equipment; the speculative era, and the tremendous impetus given to German enterprise caused by the events following the German-French war; in iron production, the saturnalia of labor in England and symptons of it in Germany; speculation resulting from all these causes.

INGOT COPPER.—Our market for English Ingot is very active, almost entirely from consumers, while Lake Copper, except by speculation, which has been and is buoyant, is neglected, consumers finding the best selections of English suit their work fully as well as the Lake Copper; and we pointed out very early in the past season the value of English Copper in the assumed scarcity of Lake. We congratulate our friends on the success of their experiments, and on the saving they have effected in the cost of their metal. Most of our city trade doubted the availability of the English Copper as a substitute for Lake Copper, but tests that we caused to be made of the best English Copper fully established its fine quality and led us to recommend its use with confidence to our friends; and that Copper is now become an established article in the market, and really, at its comparatively low prices, is commanding all the active trade from consumers—a source of economy to the manufacturer of incalculable value in the present and past Copper corners in this city. We quote Lake 34½ to 35. The English market has, however, been rapidly advancing for some weeks back, notwithstanding the rapid increase of stocks there, and the diminution of the English exports of the metal during the closing months of 1872, and also in face of the stringency of money in Europe during November and December—stocks of Copper in Europe having increased during November and December fully 2000 tons. Indeed, the Copper producing capacity of the world is shown in the imports of England, which were up to November, 1872, 64,545 tons; November, 1871, 49,754 tons; November, 1870, 51,257 tons, while English exports for the similar period were: 1872, 42,625 tons; 1871, 51,087 tons; 1870, 49,504 tons (include all articles of brass manufacture). The stocks of Copper in the great Copper marts of Europe were in December, 1872, 40,957 tons; December, 1871, 30,450 tons; December, 1870, 44,810 tons, showing in December, 1872, an excess of stock over December, 1871, of nearly 10,500 tons.

PIG IRON.—The labor troubles in the coal mining districts of England, though doubtless considerably exaggerated, have caused a reaction in this metal, and led to advances at a time when they were least expected; but the advances may at any time be modified, for the turbulent demands of these miners may be overruled by their own necessities, and the men return to work. But the increased demand for shipbuilders' Plate, manufactured Iron, Railway Bars, Merchant Bars and Sheet Iron is probably the real basis of the advances in Pig Metal in England. Our prices for Pig Iron rule at present much below the importing cost of the metal, and recent transactions here point to firm prices and to probable large advances. Speculation here, as in Europe, is active. The stock of Iron on the furnace banks has, until recently, undoubtedly been increasing, yet, in the anticipation of diminishing shipments from Europe, our trade will possibly have to rely more than ever before on home production for its supplies. The stocks now on furnace banks are greatly reduced. Prices we refrain from quoting; for, viewing the position of the English iron market, we cannot but look for sudden changes here. In Foundry Pig Irons the prices have ranged from $43 to $46 for 1 Ex., and $42 to $44 for 2 Ex., with transactions for season deliveries at these and much higher prices. In Forge Pig Irons we quote recent transactions $35 to $42, with sales of about 30,000 tons of a fancy brand at $42 at Hoboken for all year delivery, and considerable sales of less known brands at $35 to $40 for Gray Forge on furnace banks. White and Mottled sold as low as $34 per ton, but are now higher. The market is very firm, and holders indisposed to press sales and refusing large contracts for future delivery. Buyers generally concede that the market will bear no lower prices, and would, we think, purchase liberally if producers would meet them as they consider fairly. One feature of the market is well worthy the attention of consumers—the activity of an entirely outside class of speculators—thus far our iron masters have refused all overtures from such, desiring to keep aloof from all speculative movements. Since writing the above we have to record sales of over 60,000 tons Foundry Irons.

SCOTCH PIG IRON.—In Scotland the warrant stock is decreased to 90,000 tons; last year at this time it was 372,000 tons. Makers' stocks of No. 1 Iron, which are never computed in the published accounts, are probably from 100,000 to 200,000 tons more—last year much heavier than now; two-thirds of the Glasgow warrant stock are controlled by German account, while the makers refuse at present to move their stock to any extent, because of the uncertainty of the labor supply. Up to within a few weeks the prospect of Iron in Europe was for a lower range of prices; but the revival of iron ship-building and the general iron trade of the country, together with the labor strikes, seem at present to have totally changed there the aspect of prices and markets, and the effect is already felt here. Scotch Pig Irons cannot be laid down here short of $52 to $55, currency, and Forge Pig Irons short of $44 to $50, currency, while it would seem probable that the supply to the United States of rails and bars will be curtailed this year fully thirty per cent. The inflated condition of affairs and peculiar turbulence of labor in Europe will redound greatly to the permanent advantage of iron interests in the United States, if our Iron magnates will act discreetly and manage their more intelligent labor with ability and discretion. The coal owners of West Scotland notified in December a reduction of two shillings to the miners. This lead to a general strike and the blowing out of many of the larger Scotch furnaces. Prices are excited and trade restricted by the refusal of the Scotch makers to contract or sell their existing stocks.

OLD RAILS.—The European supply is at present ceased, most of the current supply being required for German account in Europe at prices far higher than could be realized here by many dollars a ton. The stocks here are 12,000 tons, and held at present for $55 to $56, currency, per ton.

SCRAP IRON—Has of late rapidly advanced here, and $50 is now demanded—though much of the stocks in yard cost, last season, over $65 per ton. Prices in Europe do not warrant new importation. The inquiry considerable and sales confined to speculation.

SPELTER—We quote 6⅞c. to 7c., gold. The markets of Europe very active and prices higher; our market, however, does not respond at present.

LEAD.—Ordinary foreign 6⅝c. to 6¾c., gold—others at 7c to 7¼c., gold. American nominal and stocks large.

TIN.—With greatly increasing stocks here and in Europe prices are at the recent advance unsteady. The supplies from Australia continue to increase, and authorities estimate them as thousands of tons for the future. We quote to-day 31c. to 32c., gold.

ANTIMONY—Though firmer, is still nominal at 14½c., gold; some ask 15c., gold.

NICKEL.—Very scarce; hardly possible to name price, $2·50 to $2·60, gold.

BISMUTH.—As per sale.

PHILADELPHIA.

PHILADELPHIA, Jan. 14.—There is a good deal of excitement in the iron market at present, and some difference of opinion as to the prospective price. *Old Rails*—Are held at $56·50, currency, both from yard and dock, for the small amount which is at present on hand and to arrive. The demand is light, owing to the lack of orders from rail mills at this season. Advices from abroad show a firm feeling, with a tendency to advanced rates—orders for shipment being taken at £8. 10s. for mixed lots D. H. & T. *New Rails*—American are quoted at $79 to $80 at mill for January and February delivery, but it is doubtful if contracts extending over a longer period could be placed, unless at considerably advanced rates. *Pig Iron*—We quote No. 1 X $46·50 to $47: No. 2 X, $45 to $46, and Gray Forge $40, all Lehigh brands, delivered here or at Hoboken. Most of the Lehigh companies decline making further sales, anticipating an advance to $50 and over for No. 1; while, on the other hand, many influential buyers look for a speedy reaction, and consider the advance purely speculative in the absence of material orders for manufactured irons. This certainly is the case this season to a greater extent than has occurred in previous years. *Bar Iron*—Is held at mill at 4 5-10, although sales from store have been made as low as 4 2-10, and 4 3-10 is the asking store rate to-day. This, of course, is from stocks bought during the depression of last month, and such a discrepancy cannot exist for any length of time.

Messrs. LLOYD, SUPPLEE & WALTON, writing under date of Jan. 14, say: The work in the jobbing houses during the past two weeks has been confined to closing up the business of 1872; the usual inventory commencing about the first week in December and closing the last week. We think the trade generally feel satisfied with the business of 1872; and although a year of unusual changes, so far as prices were concerned, the same have been maintained with a greater degree of firmness than was exhibited in either of the three preceding years. The feeling that goods would continue firm during the entire year manifested itself early in the year—consequently were held firm. The market since January 1st has shown but few changes in comparison with the anticipations of the retail trade. We hear from many customers in various portions of the country that stocks are not heavy, and parties expect to make purchases at lower rates than existed in 1872. In this we fear many must be disappointed. Many changes will, no doubt, take place during the next two weeks, but in many cases advances are talked about; and where declines have taken place, the changes are but slight. During the next week we will report the changes in prices which have taken place in our market since Jan. 1st, 1873.

PITTSBURGH.

JANUARY 10.—The pig iron trade has been brisk during the past week, the volume of business in the aggregate having been unusually large, and while the market, in consequence, is stronger, there is no quotable advance in prices. The sales reported footed up between thirteen and fourteen thousand tons, and, as is well known, there is always more or less iron sold here of which no report is made. The inquiry for the present seems to be centered mainly on good gray forge red short irons, and for these $40, 4 months, is regarded as the ruling quotation, though it is understood that some of the Western producers have instructed their brokers to hold for an advance of from $1 to $2 per ton; there are others, however, who are still willing to accept $40, 4 months, and buyers generally have resolved not to pay above that figure. Mill owners claim, even at $40, 4 months, that metal is higher, relatively, than finished irons, and while the great majority of them are willing to pay pretty freely at that price, they seem determined, for the time being, not to go above it. There is also considerable inquiry for foundry irons, and good brands are scarce and held with more tenacity. The operations in Eastern irons are very light, and it is because there is no margin at present prices; the best Eastern brands of No. 1 could not, it is asserted, be laid down here under $48 @ $49, whereas there are but few buyers above $45 @ $46. The receipts of pig iron from the East have been unusually light for several months, and no increase need be looked for until there is a radical change at one end or the other—a decline there or an advance here. The Western producers generally, as already intimated, are feeling stiffer, but some of them are still satisfied with the situation and are content to accept prices, while others are disposed to be bullish.

Trade in finished irons and nails continues dull, and has not come up to general expectation; however, it is confidently expected that orders will soon commence to flow in freely. There is no change whatever in prices.

There is a continued good demand for steel; indeed, it is much better than is usual at this particular time, and prices are firm, but unchanged.

If money would only become easier, manufacturing interests generally would be greatly benefited; this has been a great drawback to all for some time past.

The *Commercial*, of January 11, reports: The market for pig iron has been very active the past week, and all lots of good gray red short metal offered at $40, 4 months, found ready buyers. A few lots of choice brands have been sold at a higher price, and we have heard of sales of several lots at $40 and $41, 4 months, at the furnaces in Shenango and Mahoning valleys. We are reported the following sales:

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.

1,000 tons gray forge	$40 00—4 m.
700 tons gray forge	40 00—4 m.
200 tons gray forge	40 00—4 m.
400 tons gray forge red short	40 00—4 m.
200 tons gray forge red short	40 00—4 m.
100 tons gray forge red short	40 00—4 m.
600 tons gray forge red short	40 00—4 m.
500 tons gray forge red short	40 00—4 m.
70 tons gray forge red short	40 00—4 m.
200 tons gray forge neutral	40 00—4 m.
200 tons gray forge neutral	41 00—4 m.
500 tons gray forge neutral	40 00—4 m.
600 tons gray forge red short	40 00—4 m.
1,000 tons gray forge red short	40 00—4 m.
1,000 tons gray forge red short	40 00—4 m.
400 tons gray forge neutral	40 00—4 m.
200 tons gray forge red short	40 00—4 m.
500 tons gray forge to arrive	38 50—4 m.
500 tons close gray to arrive	38 00—4 m.
500 tons gray forge	p. t.

ANTHRACITE.

500 tons No. 1 Chickies forge, at furnace	$45 00—cash
550 tons No. 2 Chickies forge, at furnace	43 00—cash
330 tons Chickies forge, at furnace	40 00—cash
200 tons white and mottled, from yard	37 50—4 m.
150 tons No. 2 foundry, from yard	46 00—4 m.
100 tons No. 1 foundry, from yard	46 00—4 m.
100 tons white neutral, from yard	35 00—4 m.
100 tons No. 2 foundry, from yard	44 00—4 m.
100 tons gray forge, from yard	44 00—6 m.
100 tons gray forge, from yard	38 50—4 m.
60 tons No. 1 foundry, from yard	46 00—4 m.
50 tons No. 1 foundry, from yard	46 50—4 m.
50 tons No. 2 foundry, from yard	44 00—4 m.
50 tons No. 2 foundry, from yard	46 00—4 m.
20 tons No. 1 foundry, from yard	47 00—4 m.
20 tons gray forge, from yard	40 00—4 m.
10 tons No. 1 foundry, from yard	48 00—4 m.
10 tons No. 2 foundry, from yard	43 00—4 m.
20 tons No. 1 foundry, from yard	48 00—4 m.
10 tons No. 2 foundry, from yard	45 00—4 m.
200 tons No. 3 cold short	39 00—4 m.
100 tons No. 3 cold short	39 00—4 m.
150 tons hard gray red short	40 00—4 m.
60 tons white and mottled	35 00—cash
200 tons close gray and mottled	37 00—4 m.
200 tons gray forge	38 25—4 m.

HANGING ROCK.

38 tons No. 1 Olive	$58 00—4 m.

CONNELLSVILLE COKE.

100 tons Dunbar gray forge	$40 00—4 m.
50 tons Dunbar No. 1 foundry	42 00—4 m.

BLOOMS.

20 tons No. 1 Juniata	$120 00—4 m.

LOUISVILLE.

Mr. GEO. H. HULL, under date of Jan. 13, writes us as follows: The market exhibits an improved demand, but is without quotable change. There is still a wide difference between views of buyers and sellers of mill grades. The usual time, four months, is allowed on quotations below:

HOT BLAST CHARCOAL.

No. 1 F'dry, from Hanging Rock Ores	$57·00 @ 58·00
" 2 " " " "	52·00 @ 55·00
" 1 Forge, " " "	48·00 @ 49·00
" 1 F'dry, from Tennessee Ores	56·00 @ 57·00
" 2 " " "	52·00 @ 54·00
" 1 Forge, " "	48·00 @ 49·00
" 1 F'dry, from Alabama Ores	57·00 @ 58·00
" 1 " " Iron Mountain Ores	59·00 @ 60·00

HOT BLAST STONE COAL.

No. 1 F'dry, from Missouri Ores	56·00 @ 57·00
" 2 " " "	52·00 @ 54·00
" 1 Forge, " " "	46·00 @ 47·00

COLD BLAST CHARCOAL.

Car Wheel from Hanging Rock Ores	60·00 @ 65·00
" " Tennessee Ores	59·00 @ 60·00
" " Alabama Ores	60·00 @ 62·00
" " Georgia Ores	60·00 @ 62·00
" " Missouri Ores	58·00 @ 60·00
" " Kentucky	58·00 @ 60·00

CINCINNATI.

Messrs. ADDY, HULL & CO., under date of Jan. 13, write us as follows: *Pig Iron.*—We have to report a falling off in receipts, owing to the close of navigation by ice. The demand for Car Wheel Irons is good, and, under reduced receipts, orders are filled with difficulty. Choice grades of Hot Blast Charcoal Foundry are in light supply, with a steady demand. Low grades are dull. There are no transactions in Forge Irons except to a very limited extent, and quotations are nominal.

HOT BLAST CHARCOAL.

Hanging Rock	No. 1	$56·00 @ 57·00—4 mos.
" "	No. 2	54·00 @ 55·00—4 mos.
" "	Forge	45·00 @ 46·00—4 mos.
Tennessee	No. 1	55·00 @ 56·00—4 mos.
"	Forge	44·00 @ 45·00—4 mos.
Alabama	No. 1	56·00 @ 59·00—4 mos.
Missouri	No. 1	56·00 @ 59·00—4 mos.
"	No. 2	54·00 @ 57·00—4 mos.

HOT BLAST STONE COAL.

Missouri	No. 1	$56·00 @ 57·00—4 mos.
"	Forge	44·00 @ 45·00—4 mos.
Ohio	No. 1	55·00 @ 56·00—4 mos.
"	Forge	42·00 @ 44·00—4 mos.
Scotch Pig	No. 1	54·00 @ 55·00—4 mos.

COLD BLAST CHARCOAL.

Hanging Rock Car Wheel	$60·00 @ 65·00—4 mos.
Missouri " "	60·00 @ 62·00—4 mos.
Kentucky " "	60·00 @ —4 mos.
Tennessee " "	60·00 @ 62·00—4 mos.
Georgia " "	60·00 @ 62·00—4 mos.
Alabama " "	60·00 @ 62·00—4 mos.
Machinery and Forge	58·00 @ 60·00—4 mos.
Blooms	115·00 @ 120·00—4 mos.

CLEVELAND.

Messrs. CLEVELAND, BROWN & CO., under date of Jan. 13, write us as follows: We have nothing of special interest to communicate since our last. The extreme cold weather of the past week has had a depressing effect on trade, but considering the time of the year, there is quite as much doing as could be expected. We do not change our quotations of 6th instant. We herewith hand you our market prices:

BAR IRON, 4 6-10 rates.

NAILS, $5·35 rates.

SHEET, 6 7-10 for No. 24, other numbers in proportion.

GALVANIZED, 20 to 25 per cent. off list.

BOSTON.

JUNE 11.—The demand for Iron has been fair for the season, and there is a firmer feeling for Refined Bar, induced by the reports of further advances in England. At the present writing no advices have been received as to the results of the "Quarter Day Meetings," which were held on the 7th, 8th, and 9th of January, but cable reports early in the week were to the effect that the market was much excited, and very few if any contracts could be made at less than £13 for reliable brands. There are very few "middle men" in the market, and it is understood that the contracts held by some of them, made when the low rates prevailed, are nearly all filled. If this be true, the manufacturers will reap the full benefit of the present advance, instead of being undersold by men holding contracts which called for iron at much lower than current rates. The feeling of the heaviest operators in England seems to be that the present prices will be maintained. At £13 per ton, iron cannot be laid down here at less than from $105 to $107, and with an active demand higher prices may be looked for here. Pig Iron is very firm, but as the demand is light prices are unchanged.—*Com. Bulletin.*

SAN FRANCISCO.

JAN. 3.—*Hardware*—Trade is easing off considerably, as is usual during the holiday season. Stocks are, however, moderate, and prices steady. *Metals*—The stock of Pig Iron is said to be light, not to exceed 400 tons in first hands. Business was, during the holidays, very slack. Our quotations are largely nominal—say, Pig Iron, $50 to $52·50; Braziers' Copper, 35c. to 38c.; Bar Iron, 4c. to 5½c.; Boiler Iron, 5c. to 6c.; Plate, 6½c. to 6¾c.; Sheet, 6c. to 8c.; Tin Plate—I. C. Charcoal, 10x14, $13 to $13·50; do. I. X., 10x14, $15 to $15·50; Roofing Plate I. C. Charcoal, $13 to $13·50; Banca Tin Slabs, 40c. to 42c.; Zinc Sheet, 9c. to 10c.; Cast Steel, English, 16c. to 17c.; Lead, Pig, 5½c. to 6c.; do. Sheet, 9c.; do. Pipe, 8½c.; do. Bar, 6½c. *Nails*—Imports from January 1st to December 16th: Kegs, 216,752. There is no demand from the trade. Dealers fully supplied. The last sales, ex ship, were at $5·25 for invoice parcels. For the present the standard jobbing price is continued, $6 for 10d. to 60d.; 8d. and 9d., 25c. per keg above 10d.; 6d. and 7d., 50c. do. do. 10d.; 4d. and 5d., 75c. do. do. 10d.; 3d., $1·50 do. do. 10d.; 2d. and 3d. fine, $2·25 do. do. 10d.; Cut Spikes, all sizes, 25c. above 10d. Thus the jobbers' range is $6 to $9.—*Com. Herald.*

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, corner of South Charles and Lombard streets, report us the following prices, under date of Jan. 14, 1873: The past week has shown strong indications of an ordinary market. Present quotations are very firm, and trade has ruled very active, with a good home and foreign demand; some large sale have been made at full quotation figures.

AMERICAN REFINED BAR IRON.

1 to 6 wide by ⅜ to 1 thick	4½c. to 4¾c. per lb.
1 to 4⅝ wide by 1⅛ to 2 thick	"
Round and square, ordinary sizes, from ⅝ to 2 inclusive	4½c. to 4¾c. "
Hoop Iron, 1⅛ wide and upward	5¾ to 6 c. per lb.
Band Iron, from 1¼ to 4 in. wide	5 to 5¼c. "
Horse Shoe Iron ⅝ to 1 wide by ⅜ to ½ thick	5½ to 5¾c. "
Norway Nail Rods	7¾c. to 8c. "
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	17c. "
Machinery Steel	12c. "
Cast Spring Steel	11c. "
Homogeneous Steel Plate	13c. "
Perkins' Horse Shoes, per keg of 100 lbs	$6·87½
" Mule Shoes " "	7·87½

Common Horse Nails, from 14c. to 18c. per pound.

10	9	8	7	6
Putnam Horse Nails..23	24	25	26	28c. per lb.

R. R. Spikes.....5½ by 9-16 at 5¼c. per lb.

ST. LOUIS.

Messrs. SEMPLE, BIRGE & CO., 13 South Main street, St. Louis, under date of Jan. 11th, write us as follows: It is difficult for us to make our Hardware report this week without the use of stereotyped generalities. The New Year's trade opens much as anticipated. General depression in financial matters still obtains, and we infer from the character of the orders now coming in that consumers' demand for Hardware is confined closely to goods necessary for present use. Jobbers, however, are taking a liberal view of prospective trade, and while they are moving cautiously, in view of reasonable probability of decline in prices, they are making their orders on a scale suited to a brisk demand during the spring months. Many of our manufacturers report large orders. The Auburn Manufacturing Company's last advices say that the largest portion of their winter and spring production of Steel goods is now contracted for. The Ohio Butt Company inform the trade that the recent lull has enabled them to get even with orders, and that they are now accumulating on sizes on which they have been behind.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending January 14, 1872:

Hardware.

Alburtus G. W.
Packages, 3
Guns, cases, 4
Bryce Wm. & Co.
Casks, 2
Boker Hermann & Co.
Chains, cks., 24
Cases, 1
Mdse. pkgs., 5
Beam & Murray,
Chains, 5; casks, 85
Casks, 11
Barton, Alexander & Waller.
Guns, cases, 7
Casks, 2
Bawo & Dotter,
Cases, 4
Clark, Wilson & Co.
Files, casks, 2
Connelly T. S.
Cases, 2
Campbell H. P.
Casks, 4
Degraw, Aymer & Co.
Chains, 2; cks., 1
Dickinson Henry,
Casks, 5
Drexel, Morgan & Co.
Casks, 5
Fuller Bros.
Casks, 7
Field A. & Co.
Casks, 1
Grubb J. C. & Co.
Mdse. pkgs., 6
Harmar, Hayes & Co.
Mdse. pkgs., 2
Rosenfelt J. & Co.
Chains, casks, 16
Russell, Howes & Co.
Nails, cks., 3
Sawyer John,
Wire rope, coils, 2
Schoverling & Daly,
Mdse. pkgs., 1
Schweitzer Mfg. Co.
Mdse. pkgs, 58
Towt L. W.
Cases, 1
Van Wart & McCoy,
Files, pkgs., 2
Cases, 2
Witte John G. & Bro.
Mdse. pkgs., 8
Ward Asline,
Casks, 7
Whitney C. W.
Rivets, cks., 2
Order.
Wire, cases, 4
Anvils, 80

Iron.

Brown Bros. & Co.
Scrap, tons, 141
Bussing, Crocker & Co.
Pig, tons, 690
Congreve Chas. & Son,
Rails, 302
Darrell & Co.
Scrap, pkgs. 30; pcs 55
Pigs, 17
Holdane J. H. & Co.
Sheets, 535; bdls. 43
Jarvis G. E.
Rails, 2284
Nightingale & Kilton.
Bundles, 45
Bars, 209
Prosser Thos. & Son.
Tubes, 220; bdls., 90
Piersons & Co.
Rods, bdls., 103
Roche Bros. & Co.
Scrap, lbs., 183,778
Smith G. A. & Co.
Old rails, pcs., 1194
Smith G. G. & Co.
Bars, 997
Wright C. L. & Co.
Scrap, lbs., 132,600
Order.
Hoop, bdls., 80
Rails, 2361
Scrap, tons, 23
Pig, tons, 288
Bars, 301
Tires, 238
Without bills of lading.
Rails, 927

Steel.

Abbott & Howard,
Cases, 16
Naylor & Co.
Mdse. pkgs., 40
Piersons & Co.
Bundles, 100
Bars, 37
Sanderson Geo. & Co.
Bundles, 129
Cases, 6
Van Wart & McCoy.
Bundles, 754
Wardlow W. C.
Mdse. pkgs., 192
Order.
Cases, 27
Bundles, 336
Without bills of lading.
Tires, 21
Plates, 300
Cases, 40

Metals.

Barstow E. W. & Son.
Sheathing met., cs. 60
Brown Bros. & Co.
Plumbago, bbls., 420
Baring Bros. & Co.
Lead, pigs, 1004
Bruce & Cook,
Tin plates, bxs. 609
Dickerson J. S. & Co.
Tin plates, bxs., 2561
Figuera J.
Lead, pigs, 2000
Grund F. & Cerero,
Lead pigs, 470
Hart L. & Co.
Tin ingots, 300
Magnus E. & Co.
Scrap copper, cs., 1; hhds., 4
Naylor & Co.
Tin plates, bxs., 1496
Phelps, Dodge & Co.
Tin plates, bxs., 3506
Order.
Copper ingots, casks, 1214
Ingot copper, 3656
Tin and terne plates, bxs., 4650
Lead, pigs, 3047

J. Mamroth's Prussian Metal Review.

(Translated for The Iron Age.)

BERLIN, Dec 21, 1872.—METALS.—The metal market has presented but few noticeable features during the past few days. Its tendency, although not altogether of a discouraging nature, was apathetical throughout. Silesian *Pig Iron* was sustained at previous rates, although the dealings were quite light. Coke Pig Iron, for puddling purposes, was 4¾ thalers, or be it ⅓ thaler higher. Later "futures" in Scottish Pig showed increased firmness. Its price herefor current brands was 5⅓ to 5 5-6, while English Pig was quoted 4⅝. Among materials, prime casting was especially in favor at 4⅓ to 4 5-6; Scrap and parcel Iron ruled between 4⅓ and 4⅔, and Cast Iron 3 1-6 thalers. Rolling manufactures have been sustained with tolerable firmness; Raw Rails at 8⅓; Rolling Iron up to 12; Plates, 18; and Forging Iron 14⅔ thalers, deliverable at the Upper Silesian Works. *Copper* has been inactive; Chili and English, 59⅓ to 62½ thalers. *Tin* was, if anything, rather weak; Banca at 103, and Lamb 99. In *Spelter* but light transactions occurred, without change in quotations. *Lead* has become firmer, and prices have had an upward tendency; Tarnowitz and Saxonian Soft Lead, "spot," there, 14⅔ thalers; Clausthal a little higher. There is an improved demand for coal, and the strikes in England can hardly fail to have some effect on prices.

Schmidt, Kustermann & Co.'s Penang Tin Review.

(Translated for The Iron Age.)

PENANG, Nov. 23, 1872.—In *Tin* a pretty considerable business has been transacted, but the tendency of prices has been downward. Soon after dispatching the last mail, sales were made for the United States and Europe at $54·70 to $54·50 per picul; large arrivals, later on, caused a further decline to $54,15. Still a slight recovery took place, when still lower quotations reached us from London, causing a break to $53·10, the market closing weak; buyers keep aloof in expectation of still lower figures.

Siemssen & Co.'s Shanghae Metal and Coal Review.

(Translated for The Iron Age.)

SHANGHAE, Nov. 7, 1872.—*Metals* remain quite neglected. There has been some business in Rod Iron at 3·35 to 3·75 taels; a small lot of Swedish Steel has been done at 3·30 the 84 catties. There is a continued good inquiry for Iron Wire, and the lots coming to hand are promptly taken at 6·50 to 8·50 taels, according to assortment. The market is swept of Iron Plates. Quicksilver has risen to 78 and 79 taels for English and 80 to 82 for American. *Coals* unaltered. Cardiff lacks demand. A little cargo of English Coals was sold afloat at 9·50. American rather lower. Japan Coals are wanted at 5·75. We quote: Cardiff, 10·75, nominally; English and American, 9·50; Sydney, 9·75; New Castle, New South Wales, 9·30; Japan and Formosa, 5·75 taels per ton.

Maclaine, Watson & Co.'s Batavia Metal Report.

(Condensed for the Iron Age.)

BATAVIA, Nov. 13, 1872.—*Metals.*—*Iron*—There is little change to report, business being very quiet; holders are asking high prices, and the demand is trifling. Stocks of *Iron Nails* are decreasing, and no sales have taken place on account of the firmness of holders. Stocks of *Copper* are also reduced, but demand is inactive.

Shanghae Nail Iron Telegram.

(T. W. Muller & Co.'s Dispatch to Hamburgh via Point de Galle.)

SHANGHAE, Dec. 18, 1872.—*Nail Iron*, 3·35 taels against 3·70 5th instant.—The market is dull and irregular.

The Hamburgh Metal Market.

(Translated for The Iron Age, from the Borsenhalle.)

HAMBURGH, Dec. 20, 1872.—*Lead* is sustained, German at 14¾ to 15⅛ marks, English at 15¼, Spanish, of Rein & Co., at 15⅝. *Copper* has recently been recovering some firmness, and is now in increased demand. *Tin* moves off with ease, Banca at 17⅝ to 18 shillings, English at 17, and rods at 17⅛. *Spelter* is firm, without any dealings therein transpiring.

The Dutch Tin Market.

(Translated for The Iron Age from the "Revue Hebdomadaire.")

AMSTERDAM, Dec. 17, 1872.—*Tin*—Although the dealings since our last review, of the 10th instant, have been on a limited scale, there is a tendency toward greater firmness, influenced by the rise at London, and we quote Banca 85 to 86 guilders, and Billiton 81¼.

(Translated for The Iron Age from the "Nederlandsche Courant.")

ROTTERDAM, Dec. 17, 1872.—*Tin*—There is an improved feeling in the market and Banca on the spot has been done at 85½ to 86¼ guilders, and Billiton at 81.

The Ceylon Plumbago Market.

(Clark, Spence & Co.'s Review—Condensed for The Iron Age.)

COLOMBO, Nov. 28, 1872.—*Plumbago.*—Demand considerably in excess of supply. Prices rising. We quote lump per ton, £25 to £26; Chip, £11 to £12; Dust, £7 to £7. 10s.

Gilfillan, Wood & Co.'s Singapore Tin Report.

(Condensed for The Iron Age.)

SINGAPORE, 20th November, 1872.—*Tin.* There has been pretty free buying for America at $34½ per picul; the price of the favorite "Foong Hing" chop has been supported by a native demand, and we quote it $35½ per picul. Exchange 4s. 5⅛c. to 4s. 6d.

Charles Thorce & Co.'s Japan Metal Report via San Francisco.

(Condensed for The Iron Age.)

YOKOHAMA, Dec. 6, 1872—*Metals.*—Scarcely any business.

	₱ picul	SALES.	STOCKS.
Iron flat and round	$4·00 @ 4·70		
" nail rod	3·60 @ 4·80		
" hoop, no stock	....	700 pls	18,061 pls
" pig, nominal	1·25 @ 1·30		
" wire	9·00 @ 10·00		
Steel, nominal	5·00 @ 6·00	....	66 "
Lead "	5·50 @ 6·00	....	2,853 "
Tin plates	₱ box 11·00	....	....

Exchange, 4 5⅛ to 4 6⅝.

Arnold, Hardenberg & Co.'s Hong Kong Metal Review.

(Translated for The Iron Age.)

HONG KONG, Nov. 13, 1872.—METALS—During the week just brought to a close, the dealings in metals have again been remarkably quiet, and but in a few articles transactions of some magnitude have transpired. The following are to-day's quotations: *Nail Iron*, $3·60 to $3·70; *Rod Iron*, English, $3·50 to $3·65, Swedish, $4·30 to $4·50; *Hoop Iron*, $4·50 to $4.75; *Iron Wire*, $7·50 to $8·30 per picul; *Steel*, $3·80 to $4·40 per tub; *Common Lead*, $5·90 to $6, L. B. $6 to $6·10; W. B. $6·20 to $6·30 per picul; *Spelter*, $37·50 to $38·50 per picul; *Tin Plates*, $11 to $11·50 per box; *Quicksilver*, English, $98 to $99, and California $99 to $100 per picul. Sales: 3360 piculs nail iron, 160 piculs iron wire, 4250 piculs L. B. Lead, and 416 piculs English Quicksilver.

The demand for our Binders having proved far greater than we expected, and the manufacturer being slow in his deliveries, we find ourselves unable to fill orders for them as promply as we could wish. We must therefore beg indulgence in this matter for a few days.

OUR ENGLISH LETTER.

Review of the British Iron, Steel and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, Dec. 24, 1872.

Christmas has stolen upon us almost unawares, and it is with no ordinary satisfaction that the British iron manufacturer looks around him at the ordinarily dull season of trade, and finds that his prospects are so much brighter than they were some two months since. The improvement in the tone of the iron markets of this country, chronicled in my last week's letter, still continues, with a tendency to stiffer prices in all directions. The quotations for warrants at Glasgow, as an instance in point, have gone up steadily, and now nothing less than 117 6 is acceptable to holders. This very marked advance on the rates which prevailed a fortnight ago would now appear to have a reliable basis, seeing that the London market, to which a large tonnage of Scotch malleable and other kinds of iron is shipped, is decidedly brisker, and has had the effect of stimulating the Scotch iron trade somewhat materially. Buyers are now sending out fairly large orders in all directions, but both makers and merchants evince the greatest possible reluctance to entering into long-timed contracts at present prices. As a body, they have faith in the elasticity of trade, and believe that spring will witness a very marked renewal of activity in almost every department of the iron and general hardware trade. Nor, upon examination, would this hopeful feeling appear to be without good foundation—a conclusion which will probably be pretty universally arrived at after perusal of the detailed facts hereinafter recorded.

In the Birmingham district hot blast all mine pig is firm at £6. 10/ ; and cold blast realizes £7 readily. A number of furnaces have been blown out in South Staffordshire, and the make having thus been reduced, enhanced prices —say of from 2/6 to 5/ per ton—naturally result. There are at this time 163 furnaces in the district last named, 94 of which are in blast, the balance, 69, out. There is some probability of a rupture in the Wolverhampton locality between the iron masters and mill men, the latter of whom desire a revision of wages. The iron masters do not feel called upon to give a rise, and, therefore, unless matters can be mutually arranged, a dispute would seem to be threatened. In sympathy with, or in consequence of, the great advance in the g. m. b. warrant quotations, several of the leading Scotch makers have put up rates a trifle, as will be apparent from the following list: Gartsherrie No. 1, 130/ to 132/6 ; No. 3, 112/6 ; Summerlee No. 1, 127/6 : No. 3, 112/6 ; Carnbroe No. 1, 122/6 ; No. 3, 112/6 ; Calder, 130/ ; No. 3, 112/6 ; Glengarnock No. 1, 125/ ; No. 3, 112/6 : Eglinton No. 1, 115/ to 117/6 ; No. 3, 107/6 to 110 ; Carron No. 1, 130/ ; Shotts No. 1, 125/ ; No. 2, 110/ ; Kinneil No. 1, 120/ ; No. 3, 105/. Shipments for the week show an appreciable increase from the Scotch ports. In the Middlesborough market a firmer feeling prevails, and, as a consequence, pig is about 7 to 9/ dearer than the quotations last given. No. 3—the most useful for all general purposes—readily fetches 100/ to 105/, and No. 4, 97/6. The ironstone miners in the Cleveland district are not working on the most amicable terms, and there is some likelihood of a strike, the point in question being the "mate" system, of which these miners are so irrepressibly fond. The men insist upon it, but as the system materially reduces the quantity of stone got, the masters are determined to resist, even if the men carry out the notices they have given of their intention to leave work.

In West and South Yorkshire the pig iron manufacturers are all largely sold forward, and not a single ton of the best brands comes into the open market. Prices are hence very firm, varying from £5. 10/ to £7, according to brand. Derbyshire pig is in the same state, being largely sent into Sheffield on long dated contracts, the balance of the make going into Staffordshire and the Birmingham district. Reports from South Wales speak of an improvement in the trades under notice, and indications are not wanting of increased briskness as soon as the new year gets fairly set in.

A somewhat amusing example of the way in which arbitration—the pet child of Mr. Mundella, M. P., and one or two other equally sanguine gentlemen—works, is furnished by what occurred in Wales last week on the question of the proposed reduction in the wages of the colliers and miners of 10 per cent. Premising that this reduction has, owing to the revival of trade, been postponed from the 1st to the 18th of January, the story is as follows: The delegates who had applied to the masters, reported that at Cyfarthfa, Mr. Crawshaw said he was his own arbitrator, and would submit to no other. At Ebbw Vale, Mr. Darley declined to submit to arbitration; from Cwmbran and Pontypool no answer was returned; Lower Pauteg agreed to arbitrate ; Blænavon refused arbitration; Llanelly would follow the Nantyglo Works, in either rise or fall; Brynmawr would not submit to arbitration; Old Tredegar returned no answer; New Tredegar same; Dowlais decidedly refused to arbitrate; and from Rhymney, Abercarne and Penybout the answers were all unfavorable. The names given are in each case those of the works themselves. This result seems to be fatal to arbitration, despite which sundry gentlemen have been invited into Wales as possible arbitrators. To me it appears certain that one thing, and that only, can prevent a strike on a very large scale. It is a continued upward movement in the iron market, which will enable the owners to pay the same wages as they are now doing. The postponement already alluded to points significantly in this direction.

The coal trade of the whole country remains in a steadily prosperous state. Prices are firmly maintained, and from one or other cause an advance is by no means unlikely in or before March next. The Forest of Dean Colliery proprietors have under consideration the question of reducing wages, but at the time of writing had not come to an unanimous decision on the matter. In the Wishaw district a general strike of miners has taken place, and the men have resolved not to resume work until their wages are placed on the permanent footing of 10 per day. Several minor agitations are on foot, but it is hoped that no serious disruption in the labor market will take place as yet, if at all, supposing the revival of business to be genuine and maintained. The demand is for rails good and steady. In South Wales an order from a Birmingham firm for 1000 tons of bars has just been placed at a trifle under £10 per ton. That figure is, however, altogether exceptional, and Welsh houses are intimating that they cannot do business at that figure, and that unless other districts put up prices they will per force be necessitated to persist in reducing their men's wages to a point at which the masters will be enabled to compete with other iron making districts. Despite this, the Welsh masters, it may be remarked, only pay 7/6 per ton for puddling, as against 12/6 paid in Staffordshire. During the week Dowlais Works, (Wales) turned out a large lot of rails for America, as well as a quantity for Bilbao, in Spain, an instalment for the new line which is there being made to convey iron ore to the new port. From Aberdare 1300 tons of rails were sent in one cargo to Alexandria ; Rhymney sent rails to Rio de Janeiro ; Cyrfarthfa rails for Galveston ; Page & Co. bar iron to Lisbon ; and Llynvi Company a cargo to Salonica ; on the whole, all large Welsh iron works are pretty fully employed. The Staffordshire houses are mostly doing well and are careful not to sell forward too largely at present prices. Second class bars command, £10. 15/ to £11. 5 ; B. B. H., John Bagnall & Sons, the Mitre, and Thorneycroft & Co.'s bars are all firm at £12 per ton, with the customary addition for the S. C. crown brand. The Earl of Dudley's make is not under £12. 12/6 per ton. Rails fetch £11, except a large Russian lot, which have been taken at £10. 15/, and plates, £12. 10/. Rails evince greater firmness on the strength of more numerous specifications, and the belief that the Russian spring demand will be very largely in excess of what it has hitherto been. Sheets, tube, strip, rod and angle iron are briskly inquired for, and a decided improvement is visible in the demand for boilers. Chains and cables, the inquiry for which was temporarily checked by the new Testing Act, are again in request. Machinists, iron founders, makers of heavy hollow ware and large castings, are well employed, both at Birmingham and Sheffield. The iron tube mills at the former town are fully engaged, and manufacturers of railway rolling stock have some heavy home and foreign contracts now running. Tin plate workers are well employed, and there are exceptionally heavy orders for japanned goods to hand from several colonies and South America. Little change is noticeable in the wrought nail trade, but orders for cut nails are coming freely to hand throughout the nail-making parts of the Black Country. The Cape, Australian, East Indian, and West African trades are reported buoyant ; so that, on the whole, the great British hardware metropolis, even though it be all "Brummagen," has little or no reason to complain of its share of the national prosperity in this the eighteen hundred and seventy-second year of Christianity. Copper, chiefly Chili bars, has changed hands at £84.10 ; Burra and Wallaroo at £90 to £91 ; Lota, £83 ; with £84 for G. O. B. English copper for export, £92 to £94, and Japan copper, £87. On Thursday, at Truro, 3416 tons of copper ore realized £15,037. 15/6, an average of £4. 8 per ton ; 223 tons of fine copper, average produce 6½, average standard, £109. 9 —an advance of three guineas on the last sales. Tin fairly maintains its position, realizing, Straits, a week ago, £136 to £138, but has since gone down to £135, cash. English has, notwithstanding, made £142 ; bars, £143, and refined, £144. Tin plates are active, and have gone up some 3/. Spelter is in more constant request, and prices seem to be slightly higher. Silesian is quoted at £23. 10/ to £23. 17/6; W. H., £24. 10 —in London and its outports. English is also dearer, and fetches £23. 15/ to £24, delivered in Birmingham. Zinc averages about £28. 15/, and is in good request. Lead is easily obtainable in almost any quantity, at from £21. 15/ to £22. 5/. Should the supply, however, shorten materially, the prices will naturally advance. The Scotch malleable iron trade is very slack, chiefly owing to the difficulties in the way of obtaining an ample and regular supply of fuel. The scarcity of coals, indeed, is becoming serious, seeing that in Greenock and Glasgow, last week, a great many firms had to stop work for want of that article. There are now, it is understood, about 8000 miners on strike, owing to the reduction in wages of 1/ per ton. The Clyde shipbuilders are moderately busy. Last week, Messrs. John Elder & Co., of Fairfield, Govan, launched the Illimani, a new steamer for the Pacific Steam Navigation Company's Liverpool and Valparaiso line. She is 4200 tons gross measurement, 600 horse power, is 420 feet in length, and 42 feet in breadth, with a total depth of 35 feet 9 inches. Several Port Glasgow builders have also succeeded in obtaining some important new contracts. The Tyne shipbuilders are hardly so busy as to new orders, but have a fair amount yet in hand. All the engineering shops in the North are well employed, a remark equally applicable to the same trade at Sheffield and generally throughout Yorkshire. The larger establishments are fairly busy, the department most pressed being that for the manufacture of Bessemer steel, which is still being turned out in huge quantities. Railway materials are in great request. I hear of a firm in this neighborhood who have got a large contract for either Austria or Germany for carriage and wagon wheels, some of which they have already shipped off. The Baltic is, as you may expect, closed now, and pretty securely, too, reports speaking of wonderfully severe frosts in North Germany having come to hand. The steel trade is pretty busy, except so far as third or fourth rate firms are concerned, some of whom are letting out their converting furnaces. Sheffield last night wore its usual ante-Christmas aspect, locally known as "Bull" week. In walking through the streets, one could not help noticing the great difference. At nine o'clock I passed Joseph Rodgers & Sons' great manufactory. The place was in full motion from base to eaves—metaphorically speaking, it quivered with superabundant motion. The grinding "hull" was running at full speed, the buffers and glazers were hard at work, the forgers, packers up, and all the many departments of that great hive of industry were toiling away as laboriously as though there was not to be another working day for the next half century. The same was the case throughout all the trades of the town ; all were performing that quaint operation known to Sheffield workmen as "gettin' t' bull down." To-day that ancient and entirely figurative animal has succumbed, the men have done work for a week or so, have drawn their wages, and are fully intent upon creature comforts and general enjoyments. Most of the cutlery branches have turned out a great deal of work during the past week or two, a fair proportion of which will at once be thrown into the market, but prices are already so low that any further diminution of profit can hardly be made. The file and saw trades are fairly brisk, some of the makers being engaged in stocking anticipatory of the spring trade. Mr. Henry Bessemer has been presented by the Prince of Wales—as president of the Society of Arts—with the Albert Gold Medal awarded to him by the society for his eminent services to arts, manufactures and commerce in developing the manufacture of steel. Mr. Bessemer has, however, a tolerable good pecuniary reward for the same thing, it being supposed that the royalties on his patents bring him in a fabulous sum—some say £250,000—per annum. The amount is, I should say, in reality over £100,000. His latest idea—the suspended ship saloon—as a preventive of sea sickness, is likely to prove a remunerative speculation, commercial men having considerable confidence in Mr. Bessemer's sagacity, and scientific knowledge.

During the past year we have consolidated the Union and Backus Vises, retaining what we thought was best in each, and making a new Vise better than either. Hereafter all orders will be filled with this new Vise.

We have also commenced making a very superior Coach Makers' Vise. Our new Hand Vise is made of Solid Forged Steel, retailed at $2·00, and is meeting with universal favor. We find on careful investigation that by the pound we are selling lower than any other good Vise can be bought.

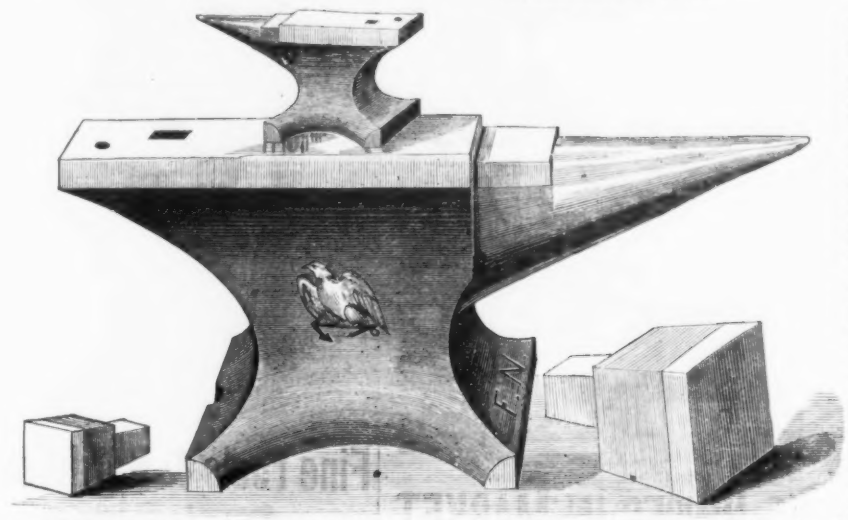
There is nothing in the market that can compete with our Six, Seven and Eight Inch Vises. All of our goods have been perfected until no fault can be found with them. They are all fully warranted, and they will all give entire satisfaction. They can be found in most of the Hardware Stores about lowest prices, but in places where they are not so kept we will sell to consumers at satisfactory rates.

THE BACKUS VISE CO.

78 Beekman Street, New York.

The Fisher & Norris Eagle Anvil Works.

(ESTABLISHED 1813.)



These Anvils are manufactured at the oldest Anvil Factory in this country, and for the past twenty-five years have maintained an excellent reputation among Blacksmiths, Machinists, Tool Makers, &c. They are *superior* to the best English, or other Anvils, on account of the peculiar process of their manufacture (invented, and used only by this concern), and from the quality of the materials employed.

The working surface is in *one piece* of JESSUP'S BEST TOOL CAST STEEL, which, after being accurately ground, is hardened and given the proper temper for the heaviest work. The *horn* is covered with and its extremity made *entirely* of *steel*. The body of the Anvil is of the strongest grade of American iron, to which the cast steel face is *warranted to be thoroughly welded and not to come off*.

The best of English anvils, after a time, become hollowing on the face by continued hammering in use, on account of the fibrous nature of the wrought iron—causing it to "settle" under the face.

The body of the Eagle Anvil being of crystalized iron, no such settling can ever occur; and the steel face, therefore, remains perfectly true. Also, it has the great advantage that being of a more *solid* material, and with less rebound, the piece forged receives the full effect of the hammer, instead of a part of the blow being wasted in rebounding, as is the case from a wrought iron anvil. An equal amount of work can, therefore, be done on this Anvil with a *hammer one-fifth lighter* than that required when using a wrought iron anvil which is more elastic.

FISHER & NORRIS manufacture to special order Anvils for Saw Makers, File Makers, Axe Makers, &c; also, Copper Smiths', Silver Smiths' and Tinmans Stakes and Blocks, with hardened and polished cast steel faces; also, the well known Parallel Chain Vises.

PRICE LIST.

ANVILS weighing 100 lbs. to 600 lbs., 11 cts. per lb.

Smaller Anvils, ("Minims.")

No. 0	1	2	3	4	5	6	7	8	9
Weighing about 10 lb.	15 lb.	20 lb.	30 lb.	40 lb.	50 lb.	60 lb.	70 lb.	80 lb.	90 lb.
Price, $3·50	$4·25	$5·00	$5·50	$6·50	$7·50	$8·00	$9·00	$10·00	$10·50

SOLD BY OUR AGENTS, (with usual discounts to the trade).

New York.—Messrs. CLARK, WILSON & CO.—RUSSELL & ERWIN MANUFACTURING COMPANY.—DURRIE & RUSHER, Boston.—GEORGE H. GRAY & DANFORTH. Philadelphia.—JAMES C. HAND & CO. Baltimore.—W. H. COLE.

FISHER & NORRIS Trenton N. J.

HOWARD PARALLEL BENCH VISE.

(BALDWIN & DICK'S Patent.)

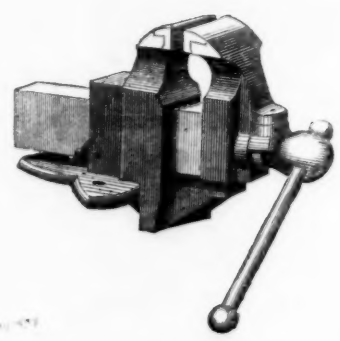


Fig. 1.

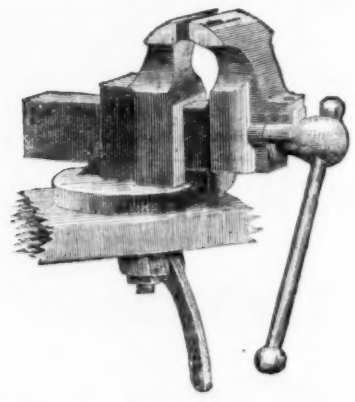


Fig. 2.

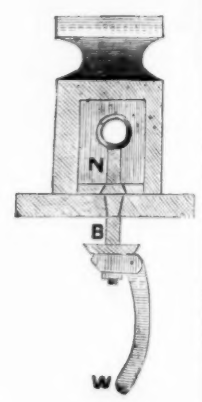


Fig. 3.

These Vises having been thoroughly tested during the past three years, and proving superior to any other Bench Vise yet produced, they are offered to the trade on liberal terms. An examination of the improvements is particularly desired.

The improvements claimed for these Vises, which are secured by Letters Patent, are: The malleable cast iron nut, which is rendered *immovable* by being set in the molten iron, thereby doubling the durability of both nut and screw, for they are saved from the destructive grinding, cutting and bending action of the cross-strain which has always been a great evil heretofore.

Another improvement is the chilling of those parts of the slide sheath that come in contact with the slide, thereby avoiding much friction in its movements.

These improvements apply to all of my vises; but additional and great improvements have been made in the *Swivel Vise*, which, in the opinion of many, must result in its being the favorite for all uses. There is great strength in its circular base, so that its side parts may be employed for light anvil uses, which is often convenient. In the center of this base, as seen in Fig. 3, is set, at the time of its being cast, the strong bolt B; the nut of this bolt, under the bench, is brought to its desired position on the bolt by the cam wrench C, W; the handle, W, is now forced down, and the cam, acting upon the short lever between the nut and the washer, exerts its very great and *duplicate* power in holding the Vise securely. So firmly does it hold it, that the combined force of several men exerted upon the Vise cannot move it from its position. And yet so convenient is the little machine, that this great power is instantly removed and applied.

The seat of the swivel is slightly concave, so that it shall rest upon the circumference of its base. Let it be observed that the nut of the bolt B is not turned in the least when the strain is upon it, and so the thread is saved from wear. The bolt is so formed and set that it cannot be drawn from the casting.

All sizes, from two to seven inch jaws, are manufactured. For prices, terms, &c., address

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Buffalo, N. Y.

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NEW LONDON, CONN.

MANUFACTURERS OF

SOLID BOX VISES.

With or without Convex and Concave Washers.

Jackscrews, Braces, Coffee Mills, Turning Lathes; Clamp Heads and Screws; Parallel Bench Vises, Sash Pullies, Ho House Pullies, Composition Cocks, Bench Screws, Vise Screws Gridirons, Drill Stocks and Bows, Box Chisels, Rivets, Sheaves, Block Pins, Composition Roller and Iron Bushings, Riggers' Screws, Caulkers' Tools, Pump Chambers, Belaying Pins, Marlin Spikes, Malleable Iron Castings, and Genera Hardware.

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Hotels, Mills, Public Buildings, &c., furnished with *Hose, Iron Piping, Hydrants* and all kinds of *Fire Supplies.*

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Patent SCREW and RING COUPLING and SPRAY NOZZLE.

☞ Send for Price List.

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John Charlton.,	Brendlinger & Co.,
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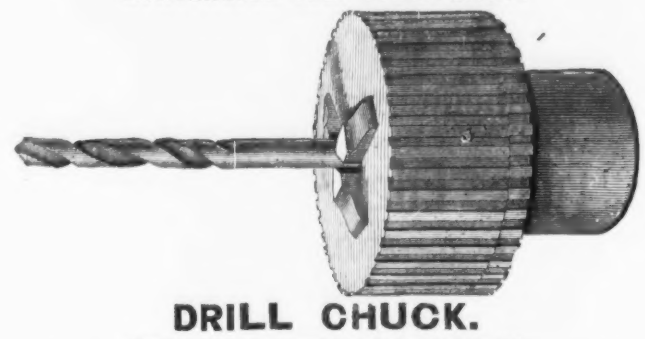

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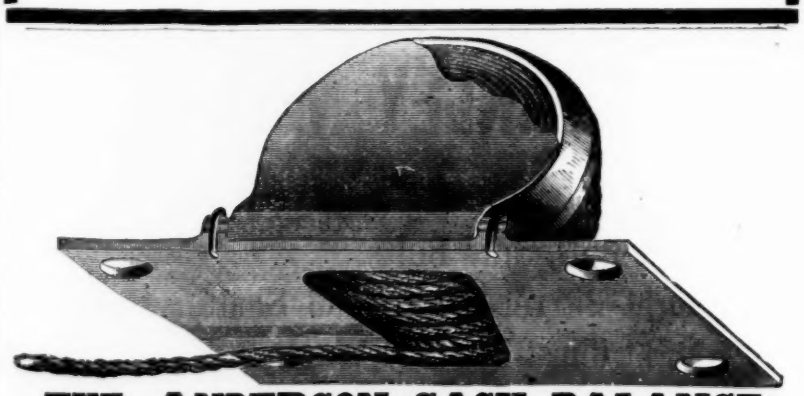
DRILL CHUCK.

(Superior to all others, and the only practical Chuck.)

☞ All the motions in this Chuck are positive. It has no spring or complicated mechanism to break, or get out of order. The Large Chuck is on the same principle precisely, and has an arrangement of the jaws for chucking small articles, for turning, boring, &c. The Small Chuck holds drills from ⅔ shank down. The Large, from ¾ down to 5-16. **Price—Small, $6·00. Large, 8·00.**

The Taylor Manufacturing Company, New Britain Conn. Hardware Manufacturers. Send for Catalogue.



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3, 4, 6, 8 quart.

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3, 4, 6, 8, 10, 12 quart

16, 20, 24, 32, 40 quarts.

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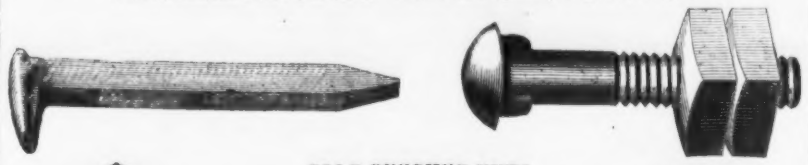

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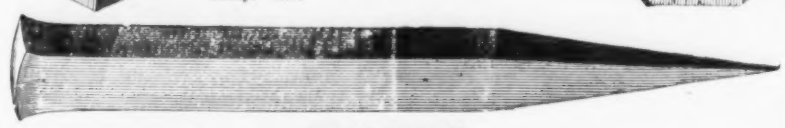

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Forged points and beveled heads. A desirable article. Orders for early spring delivery solicited.

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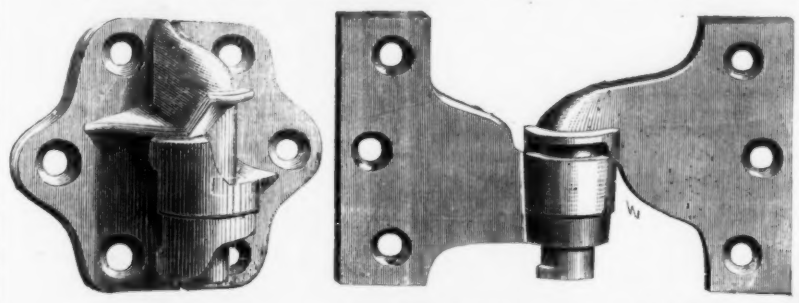

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Upper and Lower Hinges are alike, locking the top and bottom of the Blinds.

On long Blinds three or more may be used without mismatching sets, and all will fasten. They cannot be broken or closed by the wind.

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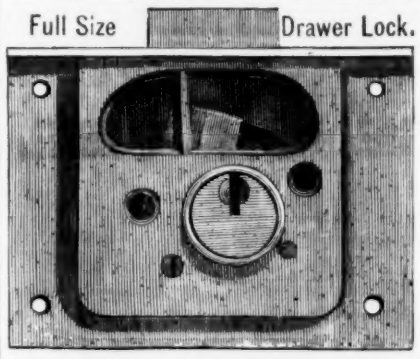

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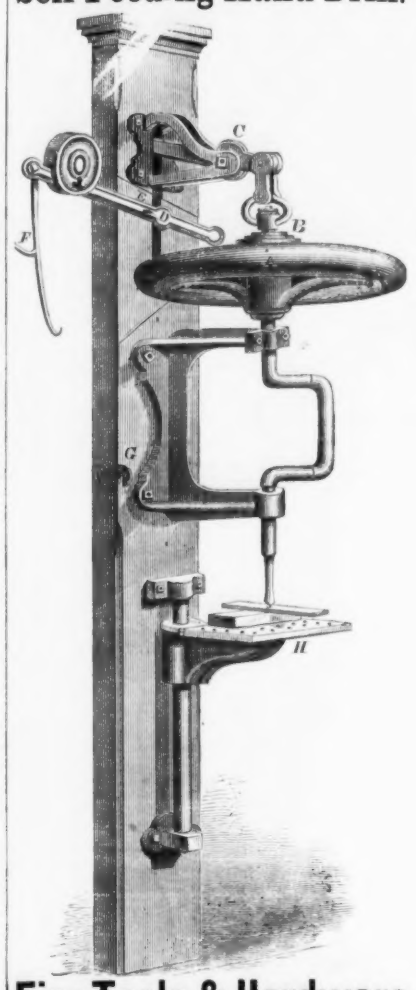

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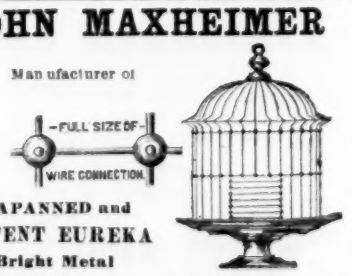

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Solid Cast Steel ₱ lb 14c
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" Hollow Augers dis 30 %
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Boardman's Patent, ⅛ in. and larger ₱ lb 37½c
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Cast Iron Barrel, Shutter, &c dis 30&10 %
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Carriage and Tire, Common dis 10&10 %
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Carriage and Tire, R. B. & W dis 40 %
Plow, R. B. & W.
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$19·00	$21·50	$24·00	$27·00	$30·00	$33·50	$36·50	$40·00

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$13·00	$16·00	$18·00	$20·00	$23·00	$26·00	$30·00

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Wrought Brass new list dis 25 %
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" " " Broad dis 15 %
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" " " Mayer dis 40 %
" " " Parliament dis 30 %
Loose Pin Butts, Plain dis 30 %
" " Japanned dis 25 %
" " National dis 25 %
Wrought Fast Joint, Narrow dis 40 %
Wrought Broad net
" Loose dis 15 %
Wrought Table and Back Flaps dis 15 %
Palmer Blind Butts net
Nicholson Blind Butts dis 30&10 %
Parker's Blind Butts dis 25 %
Clark's Blind Butts dis 30 %
Seymour's dis 30 %
Shepard's dis 30 %
Garretson's dis 40 %
Standard dis 30 %
Union Mfg. Co.'s Drilled Fast Narrow net
" " " " " Broad dis 25 %
" " " " Loose dis 35 %
Whitney & Wait's Bronze Metal dis 20 %

Caps—Percussion per 1000.

G. D. 40c
Ely's E. B. 1-4s, 67½c; 1-10s, 75c, gold
" Double Waterp'f, 1-4s, $1·57½; 1-10s, $1·65c, gold
Cole's 1-4s, 82½c; 1-10s, 90c, gold

Cartridges.

Metallic dis 40 %

Cards.

Horse and Curry dis 20&10 %
Cotton and Wool dis 10 %

Casters.

Iron and Wood Wheel Plate dis 20&10 %
Brass Wheel Plate dis 10 %
Porcelain Wheel Plate dis 30&10 %

Chain.—By the Cask.

English Coil net gold

₱ lb.	13¼	10¼	9⅛	9c	8¼	8⅛
	3-16	⅜	5-16	⅜	7-16	½

Trace, 6½–10–2 ₱ pair, gold, 65c
Trace, 7–10–2 ₱ pair, gold. 70c
Galvanized Pump Chain ₱ lb 14c
German Halter Chain new list, gold, dis 10 %
German Coil new list, gold, dis 10 %
Jack Chain, Iron dis 35 @ 40 %
" " Brass dis 20 @ 25 %

Cherry Seeders.

₱ doz. $9 00

Chalk.

White ₱ gross, 50c
Red ₱ gross, 75c
Blue ₱ gross, 75c
Crayons ₱ gross, 14c

Chisels.

Socket Firmers dis 60 %
Socket Framing dis 60 %
Socket Corner dis 60 %
Tanged Firmers dis 60 %
} Cash in 30 days an extra 5 %
Butcher's dis 40 @ 40&10 %
Spear & Jackson's $5 00 to £ gold—new list

Clips, Axle.

Norway or Best dis 20 @ 30 %
Superior dis 40 %

Coal Shovels.

Iron Handled ₱ doz, $ 85 @ 1 25
Wooden Handled ₱ doz, 1 00 @ 2 00

Cocks.

Brass Racking, Lock & Globe dis 10 %

Coffee Mills.

Common Board and Box dis 15 %
Better Grades dis 10 %
Increase Wilson's new list dis 10 %
French Steel dis 10 %
"Champion" dis 10 @ 20 %
dis 20 %

Compasses and Dividers.

Bemis dis 15 @ 20&5 %
Excelsior dis 30 %
Peck, Stow & Wilcox dis 20 %

Coopers' Tools.

Bradley's dis 15 @ 20 %

Corn Knives and Cutters.

Bradley's list net

Curry Combs.

Hotchkiss' and Kellogg's, Iron and Brass dis 10 %
Fitch's dis 20 %
Ruggles' dis 15 @ 20 %
Rubber ₱ doz, $9 00—dis 10 %

Curtain Pins.

Silvered Glass dis 40&10 %

Cutlery.

American Table
American Pocket dis 15 %

Door Springs.

Torrey's Patent $7 50 ₱ doz—dis 20&10 %
J. Palmer ₱ doz $5 50

Drawing Knives.

dis 60 %—Cash in 30 days an extra 5 %
Bradley's dis 25 %

Drills.

Morse's Bit Stock Drills dis 10 @ 15 %
Ingersoll's Ratchet (Wrought Iron) dis 25 %
No. 1, 12-in., $6 50 each; No. 2, 16-in., $8 75 each; No. 3, 20-in., $11 00 each.

Egg Beaters.

Monroe's ₱ doz net $8 25 @ 8 50
Ashley's ₱ doz net 2 25 @ 3 60
Earle's Patent ₱ doz net 5 50 @ 6 00
Pratt's Aerating dis 10 %
Dover ₱ doz net $6 00

Emery.

Genuine Chester—Regular Nos. ₱ lb 8c
" Flour and FF ₱ lb 5c
Washington Mills—Regular Nos. ₱ lb 8c
" Flour ₱ lb 5c

Enameled and Tinned Ware.

Kettles dis 10 %
Sauce Pans, Glue Pots, &c dis 5 %

Faucets.

Cork Lined, Wood dis 50 @ 50&10 %
Fenn's dis 50 %
" Cork Stops dis 40 %
Star dis 57½ %
Frary's Patent Petroleum dis 10 & 10 %
Taylor's Pattern Petroleum dis 20&10 %
Wood and Metallic" dis 40 %

Files.

American Best $5 00 to £ net
Nicholson—Mill $5 00 to £ net
" Others $5 00 to £ net
" Tapers (single cut) 5 00 to £ net
Moss & Gamble's $5 25 @ 5 75 to £ gold
J. & Riley Carr's, $5 50 to £ gold
Stubs' $8 00 @ 8 25 to £ gold
Butcher's $5 50 to £ gold
Spear & Jackson's $5 50 to £ gold
Hargreaves, Smith & Co.'s $4 75 to £ gold
Jowitt's $5 25 to £ gold
"Western" 5 00 to £ net
W. K. & C. Peace's "Imperial" $5 25 to £ gold
R. Ibbotson $5 00 to £ gold
Beam & Murray, "Cyclops" $4 85 to £ gold
Fisher's $4 75 to £ gold
Goodlad's $4 00 to £ gold

Fluting Machines.

Acme $7 00 each net
Cole 5 75 each net
Peerless, No. 2 4 00 each net
Manvill, No. 2 7 00 each net
Knox, with 4-inch Rolls 5 00 each net
" " 6 " " 6 00 each net
O. K. 6 50 each net
Excelsior, No. 1 4 75 each net
" " 2 6 50 each net
Diamond 7 50 each net
Climax, 7-inch Rolls 9 00 each net
" 4½ " " 6 50 each net
Empire 4 00 each net
Eureka, No. 1, 7-inch Roll 8 00 each net
" No. 2, 5-inch Roll 5 50 each net
K. F. M., 4½ inch Roll 6 00 each net
" 6-inch Roll 6 60 each net
Carpenter's Self-Heating 13 50 each net
Fairy, Self Heater 10 00 each net
National, 5-inch Rolls 5 00 each net
Myer's Fashion Fluter, 4½ inch Rolls 3 00 each net

Fry Pans.

Tinned—

₱ doz	$3·00	3·25	3·62	4·00	4·50	5·00	5·50	6·00	7·50
No.	0	1	2	3	4	5	6	7	8

Peck, Stow & Wilcox dis 20 %

Hammers.

Maydole's new list net
Cheney's new list net
Verree dis 5 %
Yerks & Plumb new advanced list dis 5 @ 10 %

Handles.

Hammer and Hatchet dis 10 %
Quakertown, Axe, Pick and Sledge dis 10 %
" Hammer and Hatchet net

Harness Snaps.

Judd's dis 30 %
Fitch's dis 30 %

Hatchets.

Isaiah Blood
Shingling, Nos. 1 2 3 ₱ doz $7 50 8 00 8 50 dis 10 %
Claw, " 1 2 3 ₱ doz 8 50 9 00 9 50
Lathing, " 1 2 3 ₱ doz 7 50 8 00 8 50
Hunt's net
Shingling, Nos. 1 2 3 ₱ doz $7 25 8 00 8 75
Claw, " 1 2 3 ₱ doz 7 75 8 50 9 25
Lathing, " 1 2 3 ₱ doz 7 51 8 25 9 00
Hurd's dis 20 %
Shingling, Nos. 1 2 3 ₱ doz $8 00 8 50 9 00
Claw, " 1 2 3 ₱ doz 9 00 9 50 10 00
Lathing, " 1 2 3 ₱ doz 8 00 8 50 9 00
Newark Edge Tool Co's dis 25 %
Shingling, Nos. 1 2 3 ₱ doz $6 50 7 00 7 50
Claw, " 1 2 3 ₱ doz 7 25 7 75 8 25
Lathing, " 1 2 3 ₱ doz 6 51 7 00 7 50
Yerks & Plumb dis 10 %
Shingling, Nos. 1 2 3 ₱ doz 7 00 7 50 8 00
Claw, " 1 2 3 ₱ doz 7 50 8 00 8 50
Lathing, " 1 2 3 ₱ doz 7 00 7 50 8 00
Simmon's dis 10 @ 15 %
Shingling, Nos. 0 1 2 3 ₱ doz 7 50 8 00 8 50 9 00
Claw, " 1 2 3 ₱ doz 9 00 9 50 10 00
Lathing, " 1 2 3 ₱ doz 8 00 8 50 9 00
Broad, " 1 2 3 ₱ doz 9 00 10 00 12 00
" " 4 5 6 ₱ doz 14 00 16 00 18 00
" " 7 8 ₱ doz 20 00 22 00
J. P. Verree & Co dis 5 %
Shingling, Nos. 1, 2, 3 ₱ doz $6 98 7 35 7 87
Claw, " 1, 2. 3 ₱ doz 7 56 7 87 8 40
Lathing, " 1, 2, 3 ₱ doz 6 98 7 35 7 87

Hinges.

Wrought Strap and T net
Providence Plate 6 & 8 in. list 11c
" over 8 in. " 9½c } dis 5 %

Hoes

Solid Shank, C. S. ₱ doz $8 00—dis 25 %
Socket, C. S. ₱ doz 9 00—dis 25 %
Riveted Eye ₱ doz 5 00—dis 25 %
Planters'—Winsted add 10 %
Scovill add 33⅓ %
Scovill Pattern (Winsted) add 20 %

Hooks.

Belt dis 50 %
Bench ₱ doz net $5 00 @ 8 50
Wardrobe, Japanned dis 10&5 %
Hat and Coat " dis 10&5 %
Wrought Staples and Hooks and Staples dis 60 %
WroughtHasps and Staples and Hasps, Hooks and
Wrought Staples dis 60 %
Screw Hooks and Eyes, revised list dis 60 %

Horse Nails.

Putnam's.

No.	5	6	7	8	9	10
	32c	28c	26c	25c	24c	23c

Ausable.

No.	5	6	7	8	9	10
	30c	27c	25c	24c	23c	22c

Brundage.

No.	5	6	7	8	9	10
	29	26c	24c	23c	22c	21c

Buffalo Forged.

No.	6	7	8	9	10
	30c	28c	27c	26c	25c

Globe (Pointed and Polished).

No.	5	6	7	8	9	10
	31c	28c	26c	25c	24c	23c

National (Pointed and Polished).

No.	5	6	7	8	9	10
	30c	27c	25c	24c	23c	22c

Vulcan.

No.	5	6	7	8	9	10
	33c	30c	28c	27c	26c	25c

Great Western 27c 25c 24c 23c 22c
WB. 29c 27c 26c 25c 24c
Star Brand.
Morgan ₱ lb 16c
16c

Horse Shoes.

Burden ₱ keg, $6 85
R. I. Horse Shoe Co., Perkins' Pattern ₱ keg, 6 85
" R. I. Pattern ₱ keg, 7 35
Mule Shoes ₱ keg, 7 85

Kettles.

Enameled dis 10 %
Brass ₱ lb 55c
In lots of 500 lbs. ₱ lb net 50c

Knives.

Butcher and Shoe, "Ames" dis 15 %
Hay and Straw, "Wadsworth's" dis 15 %

Knobs.

Mineral and Porcelain
Trenton Lock Co. } list June 8th, dis 35 %
Mallory, Wheeler & Co. new list dis 40&2 %
Base—Common net
" Plush Tip net
Elastic End reduced list. dis 10&10 %

Lanterns.

Brady's Patent dis 10 %
Ætna dis 10 %
Yankee dis 10 %
De Beque dis 10 %

Locks and Latches.

Russell & Erwin Mfg. Co.
Norwalk Lock Co.
Branford Lock Co
Parker & Whipple
Nashua Lock Co.
Trenton Lock Co. } List of June 8th, Dis. 25 %
Mallory, Wheeler & Co. revised list, dis 40&2 %
Pad Locks, (Mallory, Wheeler & Co). new list dis 40 %
Pad Locks, (R. & E. Mfg. Co).
Revised list Sept. 10th, dis 40&2 %
Cabinet—Eagle dis 40&2 %
Cabinet—Gaylord dis 25 %
Trunk dis 25 %
Continental dis 10 %
Shepardsons dis 15 %
dis 20 %

Meat Cutters.

Miles' Challenge Family
No. dis 10 %

₱ doz	1	2	3
	$22 00	$30 00	$40 00

Dixon's (P. S. & W) dis 5 %

No.	1	2	3	4
₱ doz	$14 00	$17 00	$19 00	$30 00

Hales' dis 10 %

No.	11	12	13
₱ doz	$27 00	$33 00	$42 00

Eddy's dis 10 %

No.	50	55	60
₱ doz	$25 00	$30 00	$40 00

Perry's Champion (P. S. & W) dis 5 %

No.	280	300	400
₱ doz	$22 00	$27 00	$43 00

Woodruff's (P. S. & W) dis 5 %

No.	100	150
₱ doz	$15 00	$18 00

American dis 25 @ 25&5 %

No.	1	2	2½	3	4	5
Each	$6 00	$9 00	$14 00	$15 00	$30 00	$75 00

Molasses Gates.

Stebbins' Pattern dis 50&10 %
Tinned ends dis 40&10 %
Weed's Patent Self-Boring dis 15 %
" without Auger Bit dis 40 @ 50 %
Patent Self-Measuring per doz $42 00—dis 20 %

Mouse Traps.

Wood Choker 20 @ 24c ₱ doz holes

Nails.

10d Cut (Standard) nominally, ₱ keg $5 50

Nuts and Washers.

3c off list

Oil Stones.

Washita No. 1. ₱ lb 22c @ 25c
Washita Slips ₱ lb 44c @ 50c
Hindostan ₱ lb 6c net
Hindostan Slips ₱ lb 10c net

Oilers.

Olmsted's dis 25&10 %
Broughton's dis 25&5 %
Common Zinc, Brass and Copper dis 20 %

Picks.

Washoe R. R. Nos.	0	1	3	3	4	5
per doz.	$14·00	15·00	16·00	17·00	18·00	
Washoe Coal, "	$8·50	9·00	10·00	11·00	13·00	15·00

Picture Nails and Knobs.

Richards' Patent dis 40 @ 40&10 %

Planes.

Auburn Bench and Fancy dis 15 %
Bailey's Patent Adjustable dis 15&10 %
Howland's Bench and Fancy dis 15&10 %
Chapin's " " dis 15 %
Chapin's, 2d quality dis 15 %
Sandusky Tool Co. dis 15&5 %
Ogontz" dis 15&5 %
Plane Irons list net
" " Butcher's $5 00 to £ gold—new list
" "Spear & Jackson's $5 00 to £ gold—new list
" " Sandusky Tool Co. list net

Pumps.

Douglas Cistern, etc new list dis 25 %
" S. & F. new list dis 20 %

Rakes.

Cast Steel dis 25

$8 00	$9 00	$10 00	$11 00
8	10	12	14 teeth.

Razor Straps.

Genuine Emerson (R. F. Badger) dis 40&10 %
Hunt's dis 25&10 %
Chapman dis 10 @ 15 %

Rivets.

Iron and Tinned dis 25 %
Copper Rivets and Burrs net @ dis 10 %

Rods.

Stair new list dis 25 %
American Patent dis 25 %

Rope.

Manufacturers' List.
Manila. ½ inch and larger ₱ lb 18½c
" ⅜ inch ₱ lb 19c
" ¼ & 5-16 inch ₱ lb 19½c
" Lath Yarn ₱ lb 18c
" Hay Rope ₱ lb 19c
Jute ₱ lb 12c
Sisal ½ inch and larger, ₱ lb 16½c
" ⅜ inch ₱ lb 17c
" ¼ & 5-16 inch ₱ lb 17½c

Rules.

Boxwood and Ivory dis 40&10 %

Sad Irons.

₱ lb 5½ @ 6c
Myer's Hat and Toilet, with stand per doz $7 00

Sand Paper—dis 7½ @ 10 %

Beader & Adamson's (Flint) 00 to 1½ $4 50 ₱ ream
" " " 2, 2½ & 3 5 00 "
Assorted 4 50 "
Star ₱ ream $3 50
Emery ₱ ream $7 00 @ 12 00

Sash Locks.

Clark's dis 25 @ 30 %
Ferguson's dis 20 @25 %
Champion per gross $13 00 @ $15 00
Norwich dis 15 %

Sash Weights.

Solid Eyes ₱ lb 3½c

Sausage Fillers.

Perry's (P. S. & W) dis 5 %

No.	1	0
₱ doz	$15 00	$21 00

Saw Rods.

list net

Saws.

Spear & Jackson's $4 50 to £ gold
John Spear $3 60 to £ gold
Am. Saw Co.
Inserted Tooth new list
All else dis 10 %
Disston's Cross Cut, Circular and Mill dis 12½ %
Hand, Panel, Butcher, Back, &c dis 7½ %
H. W. Peace's Circulars dis 7½ %
Other kinds dis 10 %
Wm. McNiece's Hand, Cross Cut and Circular new list dis 10 %
Lightning new list dis 10 %
Electric new list. dis 20&12½ %
dis 25 %

Scales.

Fairbanks' new list. dis 15 @ 20
Howe's dis 15&5%
Shattuck's Counter and Union dis 15 %
National Platform dis 15 %
Eureka dis 25 %
Scale Beams dis 25 %
No. 1 200 to 1200 lbs. dis 30 %
No. 2 " " 99c. ₱ cwt
75c. ₱ cwt

Screws.

American and National Screw Cos.
Iron revised list dis 50 %
Round Head Iron dis 40 %
Brass dis 40 %
Round Head Silver Capped new list dis 20 %
Patent Gimlet Point Coach and Hand Rail dis 10 %

Scythes.

Blood's German Steel, Grass ₱ doz $16 00
" Cast " " ₱ doz 11 00
" Silver " " ₱ doz 12 00
" German " Grain ₱ doz 14 00
" Cast " " ₱ doz 15 00
" Red Rover " ₱ doz 13 00
" Young America 10 50
" Silver Clipper 12 63
Johnson's German Steel, Grass ₱ doz 9 25
" Cast " " ₱ doz 10 50
" German " Grain ₱ doz 12 00

Shears.

Cast Steel dis 60&7½ @ 65 %
Seymour's dis 50 %
Conn. Cutlery Co., new brand dis 60 %

Shovels and Spades.

Ames list July 1, '70. list net @ dis 2½ %
Rowland list July 1, '70. list net @ dis 2½ %
Old Colony list Feb. 17, '72, dis 5 %
dis 2½ %

Shovels and Tongs.

Iron Head list net
Brass Head
Polished Steel dis 5 %

Slates.

Square Frames, R'd Corn'd, by case new list dis 15
Less than a case dis 60&10 %
Oval Frames, by case dis 50 @ 55 %
Less than a case dis 40 @ 40&10 %

Spoons.

Iron dis 30 %
By the case new advanced list dis 10
Britannia dis 20
Plated A 1 dis 20
German Silver dis 20
Tinned (P. S. & W.) dis 25&5 %
Teas add 5 %
Tables $1.50 ₱ gross, net
Stocks and Dies. 2·75

Stove Polish.

Joseph Dixon's dis 15 @ 20 %
Gold Medal ₱ gross $6 00 @ 6 25

Squares.

Steel ₱ gross $5·50
Iron net; full cases, 1
Nickel Plated old list net; full cases, 10
Try Squares and T Bevels add $2 50 @ $4 00 ₱ doz net
Star Try Squares and Bevels dis 35&10 %

Tacks.

Full Weight American Iron dis 20 %
Half Weight American Iron dis 40&7½ %
Carpet dis 40&7½ %
Brads American dis 70&7½ %
Finishing Nails dis 70&7½ %
dis 50&7½ %

₱ lb.	½	⅝	¾	⅞	1 in. and over
Trunk and Clout	25	20	17	14	12½c dis 7½ %
₱ lb.	½	⅝	¾	⅞	1 in. and over
Copper Tacks	25	20	17	14	12½c dis 7½ %

Iron Shoe Nails, ₱ lb 4-8 and longer, 10c; ₱ lb 50c—dis 7½ %
3¼-8, 10½c
Double Pointed dis 7½ %

Tapes, Measuring

American Flask and Cap Co new list dis 33⅓ %
Eddy's dis 20 %

Toe Calks.

dis 10&10 %

Tobacco Cutters.

Champion per lb 13c
Peck, Stow & Wilcox dis 20 %
Newhouse dis 10 %

Traps.

Hotchkiss dis 17½ %
Peck, Stow & Wilcox dis 20 %
Blake's Patent dis 30 %

Vises.

Trenton Vises, Solid Box. dis 15 @ 20 %
30 to 110 lbs. 17c
111 to 160 lbs. 18c
160 and over 21½c
Peter Wright's ₱ lb 15¾c. gold
Wilson's Solid Box dis 10 %
39 to 160 lbs. dis 10 %
160 and upward 21c
Jameson's Parallel dis 25&10 %
Backus, Parallel dis 25&10 %
Union, Parallel dis 25&10 %
Buffalo, Parallel new list dis 15 %
Fisher & Norris' Double Screw Parallel dis 20 %

Wire.

Bright and Annealed Nos. 0 @ 18 dis 20 @ 25 %
" " Nos. 19 @ 26 dis 30 @ 35 %
Coppered Nos. 27 @ 36 dis 35 @ 40 %
Galvanized Nos. 0 @ 18 dis 15 @ 20 %
Tinned dis 35 @ 40 %
Cast Steel dis 15 @ 20 %
Tinned Broom Wire net @ 5 %
Galvanized Telegraph, Nos. 8 & 9 dis 20 @ 25 %
" " " 10 & 11 ₱ lb 10 @ 11c
" " " 12 ₱ lb 11 @ 12c
Annealed Fence, Nos. 8 & 9 ₱ lb 11¾ @ 12¾ c
" Grape, " 10 to 14 dis 20 @ 25 %
Fence Staples dis 20 @ 25 %

Wrenches.

Baxter's Adjustable "S" ₱ lb 10c
Baxter's Diagonal dis 20 %
Collins & Co.'s dis 20 %
Coes' Genuine new dis list 30 %
Coes' Pattern (Wrought) dis 30 %
" " (Malleable) dis 45 %
Lindsay's Patent dis 50 %
Taft's Pattern dis 35 %
dis 60&15 %

METALS.

IRON.—DUTY: Bars, 1 to 1¼ cents per lb.; Sheet, Band, Hoop and Scroll, 1¾ to 1¾ cents per lb. Provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 per ton; Polished Sheets, 3 cents per lb.; Wrought Scrap, $8 per ton; Cast Scrap, $6 per ton. All subject to a reduction of 10 per cent. Railroad, 70 cents per 100 lbs.; Boiler and Plate, 1½ cents per lb.

Pig Iron.

AMERICAN.

Foundry No. 1 Lehigh ₱ ton $
Foundry No. 2 "
Gray Forge "
White and Mottled "

SCOTCH.

Gartsherrie "
Coltness " 55 00
Glengarnock " 55 00
Eglinton " 50 00 @ 52 00

Bar Iron.

Am. Refined, at mill ₱ ton, 48 00 @ 49 00

Rails.

Welsh, gold ₱ ton, 100 00
American, at works, currency, " 73 00 @ 75 00
Old Rails, D. H., currency " @ 80 00

Scrap Iron.

Wrought Scrap, from store " 50 00 @ 55

Bar Iron from Store.

Common Iron.

¾ to 2 in. round and square	₱ ton	$100 00
⅝ x 9-16 in. " " "	"	105 00
½ in. " " "	"	107 50
2⅛ to 3 in. " " "	"	105 00
1 to 6 in. wide x ⅜ and 1 in. thick	"	100 00
1½ to 6 in. wide x ⅜ & 5-16 in. thick	"	105 00
1 and 1⅛ in. x ¼ and 5-16	"	107 50

Swedish Iron.

1⅛ x ⅜ and ½	₱ ton	155 00
1⅛ x ⅜ to ½, and ¾ square	"	150 00
1¼ to 5 x ⅜ to ¾ and ⅞ to 2-in. square	"	145 00
6 to 12 x ⅜ and ½	"	155 00

Refined Iron.

¾ to 2 in. round and square	"	105 00
1 to 6 in. wide x ⅜ to 1 thick	"	105 00
1¼ to 6 in. wide x ⅜ and 5-16 thick	"	110 00
1 and 1⅛ x ¾ and 5-16	"	112 50

Large Rounds.

2⅛ to 2⅞, round and square	"	122 50
3, 3⅛ and 3⅜ in.	"	117 50
3⅝ and 4 in	"	125 00

Rods—⅝ and 11-16, round and square | " | 110 00
½ and 9-16, " " " | " | 115 00
7-16, " " " | " | 117 50
⅜, " " " | " | 122 50
5-16, " " " | " | 127 50
¼ " " " | " | 132 50
3-16, " " " | " | 152 50

Hand Iron.

1 to 6 in. x 3-16 to No. 12	"	122 50

Horse Shoe Iron.

¾ and ⅞ x ⅜, to ½	"	127 50
1 x ¾, to ⅝	"	117 50

Ovals, Half Ovals and Half Rounds.

¾ to 1½	₱ ton	130 00
⅝ and 11-16	"	135 00
½ and 9-16	"	140 00
7-16	"	145 00
⅜	"	150 00

Nail Rods

UB	₱ ℔	9c

Norway Shapes

½ to 2 in x ¼ to ¾	"	8¾c
¼ to ¾ square	"	8¾c

Norway Bar.

⅜ to 2 in. square	"	7¾c

Sprag Steel.

1 to 4 in. wide	"	10c

Tire Steel

⅞ to 1½ x ¼ & 5-16	"	10½c
⅞ & 1 x 3-16		c
⅞ & 1 x ⅜		

Toe Calk Steel

⅛ to ⅞ x ⅜ to ½	"	8¾c

Plow Steel.

6 to 16 wide	"	9¼c

Sleigh Shoe Steel

¾ to 1¼ x ⅜ to ⅝ Stock	"	8¼c
Hoops, ⅝ x No. 22	₱ ton	172 50
" ¾ x No. 20	"	142 50
" ⅞ x No. 19	"	137 50
" 1 and 1¼ x No. 18	"	132 50
" 1¼ to 2 and 1x1¼ x No. 13 & 14	"	127 50
Scroll Iron—⅜x12	"	150 00
" " 10	"	140 00
" " 3-16	"	135 00
" " ¼ and 5-16	"	130 00
" ⅝ x 14	"	145 00
" " 12	"	140 00
" " 10	"	135 00
" " 3-16	"	130 00
" " ¼	"	125 00
" ¾ x 14	"	137 50
" " 12	"	135 00
" " 10	"	130 00
" " 3-16	"	125 00
" " ¼	"	122 50
" " 5-16	"	122 50
" ⅜ x 14	"	132 50
" " 12	"	130 00
" " 10	"	125 00
" " 3-16	"	122 50
" " ¼	"	120 00
" " 5-16	"	120 00

Sheet Iron.

		English.	American
Nos. 10 to 20	₱ ℔	6¾c	8c
21 to 24	"	7¼c	8¼c
25 to 26	"	7½c	8½c
27	"	7¾c	8¾c
28	"	8c	9c
30	"	8¼ @ 9c	
Galvanized, 10 to 21	₱ ℔		12c
21 to 24	"		13c
25 to 26	"		14c
27	"		15c
Patent Polished	"		15 c
Russia	Nos. 8 @ 11,		20c @ 22 c
"	Nos. 12 @ 16,		20c @ 22 c
Belgian	"		13 c

One piece Corrugated Sheet Iron Elbows.

CHARCOAL IRON.

4¼	5	5½	6	7	inch.
$3 75	4 25	5 25	5 25	6 50	per doz.

RUSSIA IRON.

4¼		5¾	6	7	inch.
$7 00	00	13 00	13 00	14 00	per doz.

Brass.

ROLLED AND IN SHEETS.

(Brown & Sharp's Gauge.*)

For the purchase of 100 pounds and over at one time:

HIGH BRASS.

All Nos. to No. 28, and widths 14 in. and under	40c
All Nos. to No. 28, inclusive and widths over 14 to 20 in. inclusive	43c
Over 20 in. to 30 in., inclusive	46c
Half-cent ₱ ℔ advance on each No. above No. 28 to 38, inclusive.	
All Brass thinner than No. 38 is Platers' Brass at	59c
Sheets 24x48 in., and all sheets cut to particular sizes and lengths	46c
Printers' Rules	50c
Sheets wider than 30 in. and under 40 in	50c
" 40 " and over	52c
Circular sheets, in diam. from 4 in. to 14 inclusive	50c
Circular sheets, in diam. over 14 in. to 20 inclusive	53c
Circular sheets, in diam. over 20 in. to 30 inclusive	56c
Circular sheets, in diam. over 30 in. to 40 inclusive	59c
Circular sheets, in diam. over 40 in	62c

LOW BRASS.

4 cents ₱ ℔ more than High Brass.

Gilding Metals, 7c. ₱ ₱ more than High Brass.

Platers' or Gold Metal { In Bars 52c / Sawed 55c

FOR SLITTING: Metal in Width,

2 in. to ½ in., to No. 30, inclusive, 1c. ₱ ℔ advance.
2 in. to 1 in., thinner than No. 30, 2c. ₱ ℔ advance.
1 in. to ½ thinner than No. 30, 3c. ₱ ℔ advance.
½ in. and less to No. 30, 9c. ₱ ℔ advance.
½ in. and less thinner than No. 30, 5c. ₱ ℔ advance.

10 ⅌ discount.

SCRAP.

High Brass Scrap, 21 cents, net.
Low " 23 " "
Gilding, 25 cents, net.

Turnings, Filings and Chips, half the price of Scrap, net.

BRASS AND COPPER WIRE.

(Stub's Wire Gauge.)

	High Brass.	Low Brass.	Gild'g and Cop'r.
Nos. 0 to 20	43	47	53
Nos. 21, 22, 23	44	48	54
Nos. 24 and 25	45	49	55

Brass Wire straightened and cut, 4 cents advance.
10 ⅌ discount

FINE WIRE—NET PRICES.

	High Brass.	Low Brass.	Gil andd'g Cop'r.
No. 26	0·45	0·49	0·55
No. 27	0·48	0·52	0·58
No. 28	0·50	0·54	0·60
No. 29	0·52	0·56	0·62
No. 30	0·54	0·58	0·66
No. 31	0·56	0·60	0·70
No. 32	0·60	0·64	0·75
No. 33	0·64	0·68	0·85
No. 34	0·68	0·72	0·95
No. 35	0·73	0·77	1·07
No. 36	0·82	0·86	1·19
No. 37	1·02	1·02	1·32
No. 38	1·32	1·32	1·62

Ten cents per pound extra for Spooling.

TUBING

(Brown & Sharp's Gauge.)

	₱ ℔
Plain to No. 20, inclusive	$0·56
Nos. 21, 22, 23, 2c. advance on List for each No.	
Nos. 24, 25, 26, 4c. " " " "	
Above No. 26 special rates.	
Plain Tube, 1-4 inch	72
" " 3-16 "	1 57
" " 1-8 "	1 82

All Mandrel-Drawn Tubes 5c. advance on List.
Fancy Tubing 4c. advance on List above Plain.
English, Scotch, and Extra Patterns Fancy Tubing to No. 20 65
Tubing sawed or cut 2 to 4 ft. long, 2c. advance on List.
Add to two cents a half-cent for each additional cutting under two feet.

10⅌ discount.

BRASS DOOR RAIL, Polished.—32 cents per lb.—10 ⅌ discount.

BELT AND HOSE COPPER RIVETS AND BURS.

Price per ℔	57	58	60	62	64	66	68	72	76c.
Nos.	7	8	9	10	11	12	13	14	15

Braziers Rivets, 51 cents per pound.

Copper and Brass Rivets and Burs made to particular sizes and pattern.

The discount on the foregoing list will be 10 per cent.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire.
4 per cent. 12 inch. to No. 26	0·65	0·80
6 " " "	0·75	0·90
10 " " "	0·90	1·10
15 " " "	1·00	1·25
18 " " "	1·10	1·40
20 " " "	1·20	

German Silver Sheets over 12 inches wide and weighing more than 10 lbs. $2·00 ₱ ℔ tue
Advance two cents for each additional inch in width above 12 inches, and two cents per pound on each No. thinner than Nos. 26 to 36, inclusive.
All German Silver thinner than No. 36 is Platers' at 50 cents per pound additiona..
German Silver Scrap, one-third less than net price of 12 inch Market Metal; German Silver Turnings, Filings and Chips, half the price of Scrap.
*Brown & Sharp's Gauge is about two numbers finer than Stubs' Wire Guage.

COPPER—DUTY: Pig, Bar and Ingot, 5; old copper, 4 cents ₱ ℔; Manufactured (including all articles of which copper is a component of chief value), 45 ⅌ ad valorem. All subject to a reduction of 10 per cent.

American Ingot	₱ ℔	34 @ 35c
English "	"	31 @ 32c

SHEATHING, BRAZIERS' COPPER, BOLTS, &C.

Braziers Copper, ordinary sizes, over 16 oz., per square foot	45c. ₱ ℔
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot	48c. "
Braziers' Copper, 12 oz. per square foot and lighter	51c. "
Circles less than 84 inch in diameter	48c. "
Circles, 84 inch diameter and over	51c. "
Segment and Pattern Sheets	48c "
Locomotive Fire Box Sheets	45c. "
Sheathing Copper, over 12 oz. per sq. ft.	43c. "
" " 12 oz. ₱ sq. ft. & lighter	51c. "
Bolt Copper	45c. "

No Copper is Sheathing except 14x48 inches, and not to exceed 34 oz. to the square foot.

TINNING.

14x48, by the case	8c. ₱ sheet.
14x48, less than case	10c. "
Boiler Sizes, 7 and 8 inch	12c. "
" " 9 inch	15c. "
Other sizes not larger than 30x60	2½c. ₱ sq. ft.
Larger than 30x60	5c. " "
Copper Bottoms, 48c ₱ lb.; 5 ⅌ discount.	

O'NEIL'S PATENT PLANISHED COPPER.

14x48.

14 and 16 oz. and heavier	49c. By the case, 48c. ₱ ℔
12 oz. and lighter	52c. " " 51c. "

Boiler Sizes.

7 in., 14x52. 8 in., 14x56. 9 in., 14x60.

14 and 16 oz. and heavier	51c. By the case, 50c. ₱ ℔. (And all sizes not over 20 inches wide).

30x60.

14 and 16 oz. and heavier	53c. ₱ ℔.
12 oz	56c. "

LEAD—DUTY: Pig, $2 per 100 lbs.; old Lead, 1½ cent per lb.; Pipe and Sheet, 2¼ cents per lb. All subject to a reduction of 10 per cent.

Spanish	@ 6¾c gold
German Refined	@ 6¾c gold
English	@ 7¾c gold
Bar	dis 10 ⅌ 9¾c
Pipe	dis 10 ⅌ 11 c
Tin Lined Pipe	dis 10 ⅌ 16½c
Sheet	dis 10 ⅌ 11 c
Shot	dis 10 ⅌ Drop, 11¾c; Buck, 12¾c

STEEL—DUTY: Bars, Ingots, Sheets and Coils, valued at 7 cents per lb., or under, 2½ cents; over 7 cents, and not above 11, 3 cents per lb.; over 11, 3½ cents per lb. and 10 ⅌ ad val. Railway Bars 1½ cents per lb. Railway Bars, in part Steel, 1 cent per lb. All subject to a reduction of 10 per cent. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as Steel.

American Cast Steel.

Tool	17c
Spring	13½c
Homogeneous	13½c
Tire	12½ @ 13½c
Machinery (round and square)	11½ @ 12c
File	12½
Sheet	14 @ 16c
Saw Plate, mill and mulay	14 @ 16½c
aw Plate, gang and X cut	13 @ 14
circular as to size	18 @ 30c

Chrome Steel.

Tool	16 @ 18c
Machinery	11 @ 12c
File	12 @ 15c

English Steel—payable in gold, dis. 5 ⅌ cash.

do	Best Cast	₱ ℔	19½c
do	Extra Cast	"	20½c
do	Round Machinery, Cast.	"	12½c
do	Swaged, Cast	"	21½c
do	Best Double Shear	"	19½c
do	Blister, 1st quality	"	15½c
do	do 2d quality	"	13½c
do	do 3C quality	"	11½c
German Steel, Best		"	12½c
do	Eagle	"	11½c
do	3d quality	"	10½c
Sheet Cast Steel, 1st quality		"	19½c
do do	2d quality	"	17½c

SPELTER—DUTY: In Pigs, Bars and Plates, $1 50 per 100 lbs.—less 10 per cent.

Silesian, cash	6¾ @ 7c. gold
American "	7 @ 11c currency

TIN—DUTY: Plates, Sheets, Tagger and Terne, 15 per cent. ad val.: Electro-galvanized Plates, 2 cents per lb.; Manufacturers of, not enumerated, 35 per cent. ad val.—all subject to a reduction of 10 per cent. Bars, Banca or Block, and Pigs, free

Banca	₱ ℔	38c, gold
Straits	₱ ℔	@ 32c, gold
English	₱ ℔	@ 32c, gold

CHARCOAL TIN PLATE.

I C 10x14, Prime Charcoal	@ 13·00
12x12, "	@ 13·50
14x20, "	@ 14·00
I X 10x14, "	@ 15·25
12x12, "	@ 15·75
14x20 "	@ 16 25
For each additional X add	2·25 @ 2·50

COKE TIN PLATE.

	Best.	2d Quality.	Ordinary.
I C 10x14	$12·00	$11·50	$11·00
14x20	12·50	12·00	
12x12	12·50	12·00	

TERNE PLATE.

	Prime. Charcoal.	2d qual. Charcoal.	Coke.
I C 14x20	$11·50 @ 12·00	11·25 @ 11·75	10·50 @ 11·50
I X 14x20	13·50		

ZINC—DUTY: Pig or Block, $1 50 per 100 lbs. Sheet, 2½ cents per pound. All subject to a reduction of 10 per cent.

Sheet	cask 10
"	open 10½

Paper Stock, Old Metals, &c

(Dealers' Selling Prices.)

Canvas linen	5¾ @ 5¾
Canvas, cotton, No. 1	7¼ @ 7½
" " No. 2	4
White linen rags, No. 1	6½ @ 7
" " No. 2	5 @ 5¼
Colored	3 @ 3½
Mixed woolens	2 @ 3
Soft woolens	11
Gunny bagging	2¾ @ 3
Jute Butts	1¾ @ 2
Kentucky bagging	3½ @ 3¾
Book stock	4¾
Waste paper and scraps	2½ @ 3
Rope cuttings	1½ @ 3
Kentucky Bale rope	4 @ 4¼
Oakum junk, No. 1	5 @ 5¼
" " No. 2	4
Grass rope	4 @ 4½
Tarred Shaking	2 @ 2½

Old Metal.

Copper	25 @ 26
Yellow metal	18 @ 20
Brass	18 @ 21
Old lead, solid	6½ @ 7
Tea lead	5¾
Wrought Iron	1¾
Sheet iron	1 @ 1¾
Cast iron	@ 1½
Machinery iron	1¾ @
Zinc	@ 5¾
Pewter, No. 1	27 @ 28
" No. 2	19 @ 12
Spelter	7

Paints, Oils, Glass, etc.

Paints.

Black, lamp—Coach Painters	₱ ℔ 20
" " Ordinary	6c
" Ivory Drop, fair	15c
" " best	26c
Black Paint, in oil kegs, 8c, asst'd cans, 10½c	
Blue, Prussian, fair to best	50 @ 75c
" " in oil	35 @ 65c
" Chinese, dry	83c
" Ultamarine	25 @ 30c
Brown, Spanish	1¾c
" Van Dyke	.c
Carmine, French	$14 00
Green, Chrome	15 @ 25c
" " in oil	18 @ 25c
" Paris good, 30c, best, 40c	
" " in oil " 30c, " 45c	
Mineral Paints	1¼ to 4c
Orange Mineral	14½c
Red Lead, American	9¾c
" " English	10½c
" Venetian (N. C.) dry	2½c
" " in oil asst'd cans, 11c, kegs, 8½c	
" Indian, dry	10c
Rose Pink	13c
Sienna, American, Raw	4c
" Burnt	4½c
" " in oil	16 @ 26c
" Raw "	15 @ 25c
Umber, Burnt	4 @ 8c
" " in oil	16 @ 21c
" Raw	3½ @ 7½c
" " in oil	16 @ 22c
Vermillion, Chinese	1 45
" English	1 30
" Trieste	1 05
" American, Common	24c
White Lead, American, pure dry	10½c
" " " in oil	11½c
White, Paris, English, prime in bbls. 2½ @ 2¾c	
Yellow Ochre, French	2½ @ 2¾c
" " in oil asst'd cans, 11c, kegs, 8½c	
" " Vermont in casks 1¾c	
" Chrome	17 @ 21c
" " in oil	18 @ 28c
Zinc White, American No. 1 dry scarce	10c
" " " 1, in oil	12c
" French (Paris)	11½c
" " in oil	12½c

Oils.

Linseed Raw	₱ gal. casks, 93c, bbls, 94c
" Boiled	98c, " 99c
Whale, Crude	"
" Bleached Winter	"
Sperm, Crude	"
" Winter unbleached	"
" " Bleached	" 1 85
Seal, Extra Refined	" 87½c
Lard, Pure Winter	" 80c
" Spring	" 78c
Cotton Seed, Crude	" 55c
" Southern Yellow	" 65c
" White	" 75c
Neatsfoot, Winter	" $1 35
Natural Lubricating	" 45c

Sundries.

Asphaltum	8c
Benzine	₱ gal. 20c
Chalk	1½c
" Block	
Dryer, Patent, Am'n asst'd cans, 11½c., kegs, 9c	
" English " " 12c., " 11c	
Flocks	
Frostings	50c
Glue, White	33 @ 45c
" Sheet	20c
Glazier's Points, Zinc	9c
Gum, Copal	38c
Damar	25c
" Shellac, English	50c
" " dark	46c
Litharge	10c
Pumice Stone, selected Lumps	5 @ 7c
" powdered	4c
Putty in bladders	3½c
" in bulk	3c
Rotton Stone, soft, English	3c
Sand Paper, crystal	$3 25
" " flint	4 50
Spirits Turpentine	63c
Whiting, Spanish	1½c

Glass.

French Window—1st, 2d, 3d, and 4th qualities. Per box of 50 feet.

SINGLE.

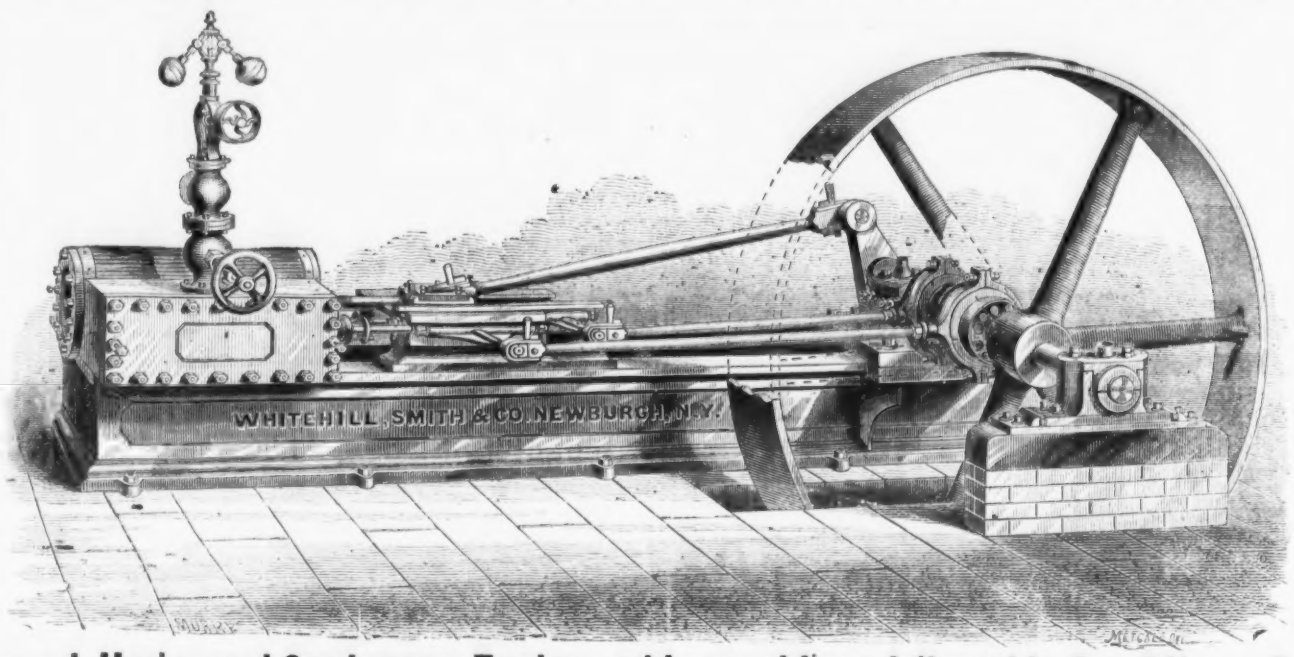
SIZES.	I.	II.	III.	IV.
6 x 8 to 7 x 9	$8·00	$7·00	$6·50	$6·00
8 x 10 to 10 x 14	9·00	8·00	7·25	6·50
10 x 15 to 12 x 16	9·75	8·75	7·75	7·00
11 x 18 to 16 x 22	10·25	9·25	8·25	7·50
15 x 24 to 15 x 32	12·50	11·50	10·50	8·50
20 x 28 to 22 x 30	15·00	13·00	11·00	9·00
26 x 28 to 22 x 36	16·00	14·50	12·50	
24 x 36 to 24 x 40	18·00	16·00	13·50	
28 x 38 to 26 x 44	18·50	16·50	14·00	
28 x 44 to 30 x 48	20·50	18·00	15·00	
30 x 50 to 32 x 52	22·00	20·00	16·00	
32 x 54 to 32 x 58	26·00	23·00	18·50	
34 x 58 to 34 x 60	30·00	27·00	22·50	
36 x 60 to 40 x 60	36·00	33·00	28·50	

DOUBLE.

SIZES.	I.	II.	III.	IV.
6 x 8 to 7 x 9	$12·00	$11·50	$10·00	$9·50
8 x 10 to 10 x 14	13·50	12·00	11·00	10·00
10 x 15 to 12 x 16	15·00	14·00	12·50	11·00
11 x 18 to 16 x 22	16·50	15·50	14·00	12·00
15 x 24 to 15 x 32	20·00	18·00	17·00	
20 x 28 to 22 x 30	24·00	22·00	18·50	
26 x 28 to 22 x 36	26·50	24·00	22·00	
24 x 36 to 24 x 40	30·00	27·00	23·50	
28 x 38 to 26 x 44	32·00	28·50	25·50	
28 x 44 to 30 x 48	34·50	31·00	27·00	
30 x 50 to 32 x 52	36·50	33·00	28·50	
32 x 54 to 32 x 58	43·00	39·00	34·00	
34 x 58 to 34 x 60	50·00	45·00	40·00	
36 x 60 to 40 x 60	60·00	55·00	50·00	

Discount 40 to 40&10%.

Circular and Prices Furnished on Application.



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Improved Horizontal Stationary Engine, with or without Adjustable Cut-Off, as Desired.

We are making a *specialty* of the above Engines, and are enabled to furnish them at LOW PRICES.

We have on hand at all times a number of sizes *finished complete*, ready for delivery; and also a portion of each size—Cylinders, &c. (finished)—enabling us to furnish complete and deliver any size on very short notice.

All of the parts are of the *best material* and *workmanship*. *The Main Journals run in Brass Boxes; Cross Head has Brass Gibs; Piston Rod and Crank Pin of Steel; Force Pump, Oil Cups, Regulating Governor, and Steam Stop-Valve, Balance Pulley or Fly-Wheel.*

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BUY SWAIN TURBINE WATER-WHEEL.

WHY?

THEY GIVE THE BEST RESULTS, BOTH AT FULL AND PARTIAL GATE, OF ANY WHEEL IN USE, AS SHOWN BY THE RESULT OF THE TESTS MADE BY MESSRS. JAS. B. FRANCIS, HYDRAULIC ENGINEER FOR THE LOWELL COMPANIES, AND HIRAM F. MILLS, HYDRAULIC ENGINEER FOR THE LAWRENCE COMPANIES.

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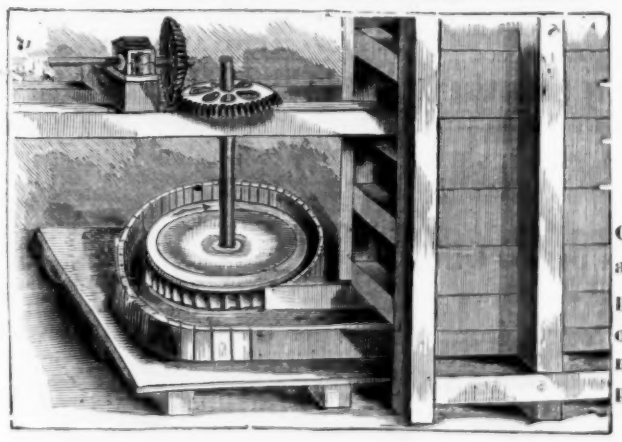

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Giving as good a percentage of power as any other, and at much lower price.

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Manufacturers of all styles

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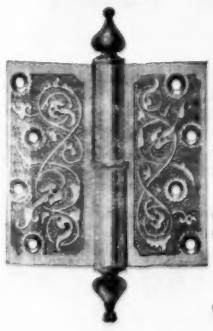

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Drilled and Wire Jointed.

Japanned, Figured Enameled, Nickle Plated, with and without Cap, and Real Bronze Butts.

Also, a full line of

IRON PUMPS,

Cistern, Pitcher Spout, Suction and Force, Yard, Garden, Engine Yard, Drive Well, &c., and all with the most modern improvements.

☞ Fine Castings a Specialty.

NEW BRITAIN, CONN.

Warehouse, 55 Chambers Street, NEW YORK.

ERIE RAILWAY.

WINTER ARRANGEMENT of Trains taking effect Nov. 4th, 1872. From Chambers St. Depot. (For 23d St. see note below).

9·00 A. M. Cincinnati and Chicago Day Express. Drawing Room Coaches to Buffalo and Niagara Falls, and Sleeping Coaches to destination.

11·00 A. M. Express Mail for Buffalo and Niagara Falls. Drawing Room Coach to Susquehanna and Sleeping Coaches to destination.

5·30 P. M. Night Express. Sleeping Coaches to Buffalo and Niagara Falls.

7·00 P. M. (Daily) Cincinnati and Chicago Night Express. Sleeping Coaches through to Cincinnati, Buffalo, Niagara Falls, and thence to Chicago.

Additional Trains leave for

Newark, 6·30, *8·45 and 11·30 A. M., and 3·15, 5·15 and *6·30 P. M.

For Port Jervis, 8·00, 9·00, 11·00 and *11·15 A. M., 4·30, 5·30, †6·30 and *7·00 P. M.

For Goshen and Middletown, *7·30, 8·00, †8·30, 11·00 and *11·15 A. M., 3·30, 4·30, 5·30, †6·30 and *‡7·00 P. M.

For Warwick, 8·00, 11·00 and *11·15 A. M., 4·30 P. M.

For Newburgh, 8·00, †8·30, 9·00 and 11·00 A. M., 3·30, 4·30 and 5·30 P. M.

For Suffern, †7·30, 8·00, †8·30, 11·00 and *11·15 A. M., 5·30, 5·00, †6·30, 7·00 and *11·30 P. M.

For Ridgewood, Hohokus, Allendale, and Ramsey's, †7·30, 8·00, †8·30, 11·00, *11·15 A. M., 3·30, 5·00, 6·00, †6·30, 7·00 and *11·30 P. M.

For Paterson, 6·45, *7·30, 8·00, †8·30, 10·00, 11·00, *11·15 A. M., 12·00 M., *1·45, 3·30, 4·00, 5·00, 5·15, 5·30, 6·00, *6·30, *7·00, 8·00, 10·00 and *11·30 P. M.

For Rutherford Park and Passaic, 6·45, *7·30, †8·30, 10·00, 11·00 A. M., 12·00 M., *1·45, 3·30, 4·00, 5·15, 6·00, *6·30, 8·00 10·00 and *11·30 P. M.

For Hackensack and Way, 5·00 8·15 and †8·45 A. M., 1·00, 4·00, 5·00, 6·00 and 6·30 P. M., and Saturdays only, 12·00 midnight.

For Hillsdale and Way, 5·00, 8·15 and †8·45 A. M., 1·00, 4·00, 5·00 and 6·00 P. M., and Saturdays only, 12·00 midnight.

For Spring Valley and Way, 5·00, 8·15 †8·45, and ·00 A. M., 1·00 4·45, 5·00 and 6·00 P. M., Saturdays only 12·00 midnight.

For Englewood 5·00, 7·45, *9·00, A. M., 1·30, 3·15 4·15, 4·45, 5·30, 6·30 and *7·45 P. M. Saturdays only, 12·00 midnight.

For Cresskill, 5·00, 7·45, *9·00 A. M., 1·30, 3·15, 4·15, 5·30, 6·30 and *7·45 P. M. Saturdays only, 12·00 midnight.

For Upper Piermont, 5·00, 7·45, *9·00, A. M., 1·30, 4·15, 4·45, 5·30, 6·30 and †7·45 P. M. Saturdays only, 12·00 midnight.

For Piermont and Nyack, 7·45 and *9·00 A. M., 1·30, 4·45, §5·30, 6·30 and †7·45 P. M. Saturdays only 12·00 midnight.

N. B.—Trains leaving Chambers street on even hours or half hours leave 23d street fifteen minutes earlier than above time. The 5·00 A. M., 10·00 and 11·30 P. M. Trains start from Chambers Street only.

N. B.—Trains on the N. R. R. and Newark Branch leaving Chambers street on quarter hours, leave 23d street thirty minutes earlier than above time.

Tickets for passage and for Apartments in Drawing Room and Sleeping Coaches can be obtained, and orders for the checking and transfer of Baggage may be left at the Company's offices: 241, 529 and 957 Broadway; cor. 125 street and 3d avenue; 4 Court street, Brooklyn; at the Company's Depots, and of Agents at the principal hotels.

* Daily. † Sundays only. *‡ Goshen Sundays only. § Nyack only.

JNO. N. ABBOTT, General Passenger Agent.

Capron's Improved Turbine WATER-WHEEL.

POLISHED & DETACHABLE BUCKETS

CHEAPEST & BEST WHEEL MADE.

CAPRON WATER WHEEL CO. HUDSON N.Y.

Joshua Scholefield Sons & Goodman,

GENERAL HARDWARE MERCHANTS,

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EDWARD FRITH, Agent,

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Chain and Pulley for Heavy Sash

F. & L. MANY & MARSHALL,

48 Warren Street, NEW YORK,

Manufacturers of every description of

BUILDERS' HARDWARE,

Pure Bronzed Metal and Hand-Plated Knobs, Hinges, &c.,

For First-Class Dwellings and Public Buildings.

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PAPER BOX MAKERS' DO.,

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New York Agents.

White Lead, &c.

Cornell Lead Co.,

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G. CORNELL & SON WARRANTED PERFECTLY PURE WHITE LEAD BUFFALO, N.Y.

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WHITE LEAD Dry and in Oil,

Lead Pipe, Sheet and Bar Lead.

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THE UNION WHITE LEAD MANUFACTURING COMPANY. PURE

Union White Lead Mfg. Company,

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S. W. HOW, Secretary. JAMES HOW, President

MANUFACTURERS OF

White Lead, Red Lead, Litharge, Orange Mineral.

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ATLANTIC WHITE LEAD CO. ROBERT COLGATE & CO. WARRANTED PURE.

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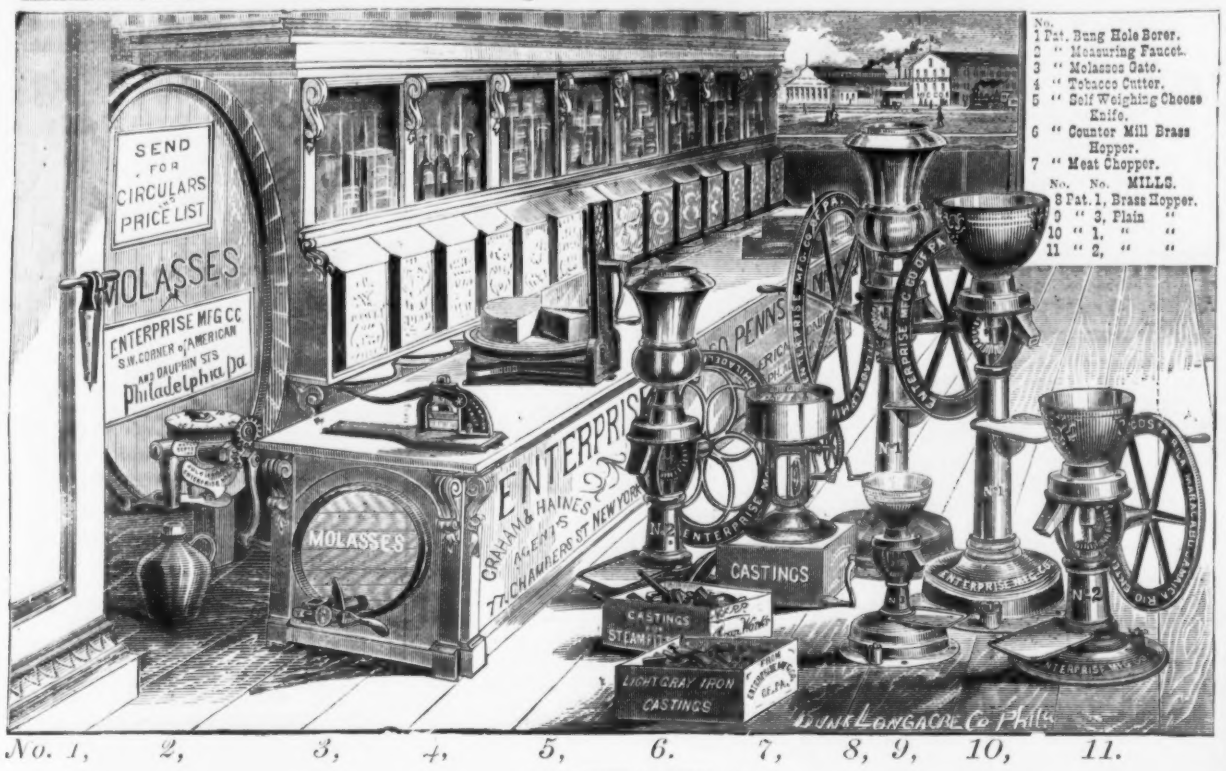

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Plane Irons, Carpenters', Cabinet Makers', and Coopers' Tools

BENCH, HAND, AND TAIL SCREWS

and all kinds of **SMALL HANDLES.** We use only **Second-Growth Ohio Timber** in our Planes, and warrant our Irons equal to any in the market.

Our Planes are better shape, finer finish, and better timber than any other tool in the market

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Our Patent Stamped Corrugated Bottom Coal Hods

Are conceded to be the best in the market.

Common Hods, Morning Glory Hods, Excelsior Hods for self-feeding Stoves, and all kinds of Fancy Hods.

Fry Pans. Excelsior Polished Deep Fry Pans, and Unpolished Deep Fry Pans.

Excelsior Broiler. This Broiler has been pronounced by all who have seen and tried it to be the best in the market.

Galvanized Sheet Iron Water Pails, Well Buckets, Tea Kettles, Ash Cans, Chamber Pails, &c., &c.

Patentees and Sole Manufacturers of the combined Chamber and Commode Pail, and manufacturers of all kinds of Japanned and Galvanized Goods.

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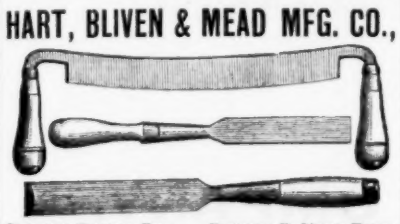

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Three Sets of Factories at Kensington Conn.,

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RIPLEY MFG. CO.,

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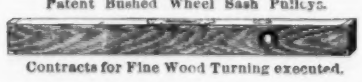
Adjusting Plumbs and **LEVELS,** Mallets.

Boxwood and Ivory **RULES,** Door Stops.

Best Choker Traps, Steak Hammers,
Cover Lifters, Automatic Boot Jacks,
Patent Bushed Wheel Sash Pulleys.



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We make the greatest variety of any house in the States. We confine ourselves exclusively to their manufacture, and guarantee the quality. We solicit only the trade, to whom we are prepared to give the best prices.

ESTABLISHED IN 1844.
108, 110, 112, 114 Adams Street,
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Sole manufacturers of Ford's Celebrated Patent Casters.

Pipe, Fittings, &c.

McNab & Harlin Mfg. Co.,

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For STEAM, WATER and GAS.

Wrought Iron Pipe & Fittings, Plain and Galvanized.

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FOR HIGH & LOW PRESSURE STEAM HEATING APPARATUS FOR ALL CLASSES OF BUILDINGS.

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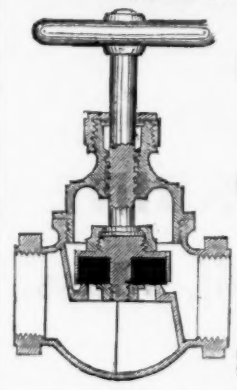

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Warranted the most reliable and durable in the country.

CAST IRON PIPES,

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WILLIAM GRAFF & CO.,

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For

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Pipe of any Size, Length or Thickness furnished to order.

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FITTINGS FOR

Steam, Gas and Water,

PLAIN AND GALVANIZED

WROUGHT IRON PIPE,

Nos. 62 & 64 Gold Street,

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Business Established, 1836. Incorporated, 1872.

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Manufacturers of

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For Gas, Steam and Water.

Brass and Iron Valves, Cocks,

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Tubes cut and fitted to plans and specifications.

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WASHINGTON PIPE WORKS,

Office, No. 8 Central Street.

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The Washington Pipe Works

are now in full operation, and I take this method of informing my friends and the public that I am now prepared to fill all orders for the different size of

STEAM & GAS PIPE & FITTINGS

Of the best quality and at the lowest market rates.

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Pumps, Water Closets, Fountains, Vases, &c.

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106, 108 & 110 Centre Street,

Factory, Mott Haven, New York.

ROBBINS' PATENT PIPE WRENCH.

Specially designed for large Pipe and heavy work, and for that use is the best universal wrench in market.

Manufactured by

RICE, ROBBINS & CO.,
Pittsfield, Mass.

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(Corrected weekly by Loya, Supplee & Walton.)

Terms, 30 days. For 60 or 90 days' interest added at 10 per cent. per annum.

ANVILS.

Solid Cast Steel ⅌ ℔ 12½c
Peter Wright's ⅌ ℔, gold, 12½c
Wilkinson's 11½c
Eagle, ⅌ ℔ 11 cents, currency dis 15%

APPLE PARERS.

Reading / Turn Table } per doz $8 50
Union per doz 8 00

AXES.

Mann's light $14 00, dis 10 %
Hunt's, Light 15 00, dis 5 %
Red Indian, all sizes net $14 00
Red Chieftian " net 14 75

AUGERS AND BITS.

Bates' Manufacturing Co.'s Bits dis 20 @ 20&5 %
Douglas' " " " " dis 20 @ 25 %
Ives' " " " " dis 20 @ 20&5 %
Bonney's Pat. Hollow Augers dis 25 %
Bates' Mfg. Co. Augers dis 20 @ 20&5 %
Ives " " dis 20 @ 20&5 %
Douglas " " dis 20 @ 25 %
Cook's Patent Bits dis 25 @ 25&10 %
Russell Jennings' Bits dis 10 %

BALANCES.

Landers, Frary & Clark's dis 10 @ 15 %
Chatillon's dis 10 @ 15 %
Morton's dis 10 @ 15 %
Common Spring, with Hook ⅌ doz $1 38 @ 2 00

BELLS.

Bevin Bros. Mfg. Co. Hand Bells dis 50 %
Other makers, light dis 50 %
Cone's Door Bells dis 10 %
Western and Kentucky dis 50 %

BORING MACHINES.

Bates' Mfg. Co., complete with augers dis 10 @ 15 %
Douglas' " " " dis 10 @ 15 %
Common No. Augers $4 25 @ 4 00
Angular, Extra, No. Auger 5 50 @ 5 00

BOLTS.

Eastern Carriage Bolts dis 50&15 %
Western " " dis 50&15 %
Philadelphia Carriage Bolts dis 45 @ 45&5 %
Wrought Shutter Bolts dis 35&10 %
Cast " " dis 35 %

BRACES.

Barber's dis 30&10 %
Bartholomew's dis 10 @ 15 %
Spoffard dis 33⅓ @ 37½ %

BUTTS.

Cast Fast Joint, Narrow dis 15 %
" " Broad dis 30 %
Cast Loose Joint dis 40 %
Acorn Drilled dis 33⅓ %
Wrought Loose Pin new list dis 20 %
Wrought Table net
" Narrow list net
" Loose Joint dis 25 %
Parker's Blind Butts } dis 25 %
Shepard's " " } By the case
Clark's " " } dis 30 %
Lull & Porter's do. dis 25 @ 25&5 %
Palmer's do. dis 30 @ 30&5 %

CHAINS.

German Halter, new gold list net
" Coil new gold list net
Galvanized Pump ⅌ ℔ 15c
English Coil, less than cask add ½c. ⅌ ℔
Common Chain, ½c. ⅌ ℔ less.

⅌ ℔	14	11	10½	9½	9½	9	8½c gold
	3-16	¼	5-16	⅜	7-16	½	⅝ in.

Best Proof, by the cask, 560 lbs.; less than cask add ½c.

CHISELS.

Socket Framing dis 60 @ 60&5 %
Socket Firmer dis 60 @ 60&5 %
Tang Firmer dis 40 @ 40&5 %
Beaty's Framing and Firmer dis 10 @ 10&5 %

CASTERS.

Porcelain Wheel dis 30&10 %
Iron dis 20&10 %
Brass dis 10 %

CLOTHES WRINGERS.

Reliance advanced March 7 per doz $72 00
Crown " " 7 " " 72 00
Monitor " " 7 " " 72 00
Universal " " 7 " " 72 00
Novelty " " 7 " " 72 00
In 5 dozen lots assorted, at one time $70 00 per doz.

COFFEE MILLS.

Common Box and Side advanced April 1872 dis 15 %
Patent " " " " " dis 10 %

CUTLERY.

American Pocket (best) dis 20 @ 25 %
Landers, Frary & Clark, J. Russell & Co., and Lamson & Goodnow Mfg. Co. } dis. 15 %

DRAWING KNIVES.

Hart Mfg. Co.'s dis 60 @ 60&5 %
Concave Adjustable Handle dis 10 %
Beatly dis 10 %

FILES.

Nicholson Mill Files new list, $5 00 to £ cur
" Bastard " " 5 00 to £ cur
" Taper " " 5 00 to £ cur
Butcher's Mill / " Bastard / " Taper } Unsettled

FLUTING MACHINES.

Royal, No. 1, 4½ inch Rollers list $6 00
" No. 2, 6 inch Rollers list 7 00

HAMMERS AND HATCHETS.

Yerkes & Plumb's dis 5 @ 10 %
Hammond & Son's dis 5 @ 10 %

HINGES.

Strap and T list net
Bonney's Gate dis 20 %

HORSE NAILS.

	Nos. 6	7	8	9	10
Ausable Horse Nails	27	25	24	23	22
Globe " "	29	26	25	24	23
Putnam " "	30	28	27	26	25
Brundage " "	26	24	23	22	21

On Ausable Globe & Brundage 1000 ℔ lots dis 5 %

KNOBS.

Door (regular manufacture) dis 25 %
Porcelain and Mineral dis 25 %

LOCKS AND LATCHES.

[illegible] and Mortise dis 25 %
Till and Cupboard dis 20 @ 25%
American Padlocks dis 40 %
Trunk Locks dis 5 @ 10 %
Thumb and Roggens Latches net @ dis 10 %

MATTOCKS.

Long and Short Cutter dis 10 %
Western Pattern dis 10 %
Pennsylvania Pattern dis 10 %

MOLASSES GATES.

Enterprise Mfg. Co.'s Measuring Faucets dis 20 %
Stebbins' Gates dis 40&10 @ 50 %
Lincoln's " dis 40 @ 40&10 %
Landers, Frary & Clark's, Petroleum dis 10 @ 10&10 %
Taylor's Petroleum Faucets dis 20 @ 20&10 %

MEAT CUTTERS AND STUFFERS.

Stow Mfg. Co. Meat Cutters, new list dis 5 %
Dixon " " " dis 5 %
Hale " " " dis 10 %
Stow Mfg. Co. Stuffers dis 5 %

RULES.

Stanley Rule and Level Co. dis 30&10 %
Stevens and Hubbard's dis 30&10 %

SQUARES.

Steel Squares, advanced August 1st list net
Iron " " " 1st list net

SAWS.

Disston's Hand, Mill and Circular dis 12½ %
Wm. McNiece's Hand, Cross-Cut and Circular, new list dis 10 %
Boynton's Lightning, new list dis 30 %

SHOVELS AND SPADES.

Rowland's Plain Back, advanced Apr. 1872 dis 5&5 %
" Back Strap " " " dis 5&5 %
Oliver Ames & Sons, advanced April 8 net list
Brady Shovel Co. dis 7½ %

SAD IRONS.

Reading (planed face) per lb. 6c.
Coquanock (polished face) " 5c.

STOVE POLISH.

Gem per gross $5·00
Onyx " $5·00

SASH LOCKS.

Clark's Patent dis 20 %
Ferguson " dis 20 %
Bonney's " Improved dis 25 %

SCREWS.

Iron (list Mar 6) dis 50 %
Brass (Brass Screw list) dis 40 %

SPOONS.

Plated Spoons, Rogers Bros. dis 25 %
Britannia, Parker's and Boardman's dis 20 %
German Silver add 10 % to list
" " Light list net

TRY SQUARES.

Stanley Rule & Level Co. dis 40 %
Diston's dis 12½ %

TACKS, CLOUT AND FINISHING NAILS.

Half Weight Tacks dis 70 %
" " by case dis 70&7½ %
Clout and Finishing Nails 7½ %
" " by the case dis 7½ %

TRAPS.

Genuine Oneida—Newhouse list dis 15 %
Imitation " " " dis 20 %

WRENCHES.

Coes Genuine dis 30 %
Coes Imitation Wrought Bar dis 40 %
" " Malleable Bar 40&10 %
Tafts Wrought Bar 60 %
Tafts Malleable Bar 65 %

WIRE.

No. 0 to 18 dis 15 %
No. 19 to 26 dis 27½ @ 30 %
No. 27 to 36 dis 33⅓ @ 35 %
Coppered 0 to 12 dis 15 @ 20 %
Tinned Broom Wire dis 10 @ 15 %

Bradlee & Co., Office Nos. 19 & 21 South Fourth st., Philadelphia. Price list of Proved and Warranted Chains. Discount ¾c. per ℔.

SHORT LINK CHAIN.

Size. Inches.	Average Wt. Per Fathom. Lbs.	Proof. Tons.	Price Cts. Per Lb.
½	15	4	10½
9-16	19	5	10
5-8	25	6	9½
11-16	30	8	9·3
¾	35	10	8¾
13-16	40	12	8⅝
⅞	47	14	8½
15-16	54	16	8⅜
1	60	18	8¼
1 1-16	67	20	8⅛
1⅛	74	23	8
1 3-16	82	26	7⅞
1¼	90	28	7¾

All larger sizes same price as 1¼ inch.
Stud Chain 2½c. less than same size close link.

PITTSBURGH.

From the Pittsburgh Commercial.

FLAT BAR.

1½ to 4 by ⅜ to 1 inch 4·6c
4½ to 6 by ⅜ to 1 inch 4·8c
1¾ to 6 by 1⅛ to 1½ inch 5·0c
1¼ and 1⅜ by ⅜ to ¾ inch 4·8c
1 and 1⅛ by ⅜ to ¾ inch 4·9c
⅝, ¾ and ⅞ by ⅜ to ⅝ 5·0c

HORSE SHOE.

All sizes 6·1c
Nail rods 8 5c

HEAVY BANDS.

3½ to 6 by ¼ and 5-16 inch 5·2c
1½ to 3¼ by ¼ and 5-16 inch 5·3c
⅞ to 1⅛ by ¼ and 5-16 inch 5·6c
½ to ¾ by ¼ and 5-16 inch 5·8c

LIGHT BANDS.

3 to 6 by 3-16 to No. 12 5·6c
1½ to 2¾ by 3-16 to No. 12 5·8c
1 to 1⅜ by 3-16 to No. 12 6 2c
½ to ⅞ by 3-16 to No. 12 6·8c

HOOPS.

2¼ to 3 inch 5·9c
3½ to 4½ inch 6·1c
1¾ to 2 inch 6·1c
1⅜ to 1 11-16 inch 6·4c
1⅛ and 1¼ inch 6·7c
1 inch 7·1c
⅞ inch 7·6c
¾ inch 8·1c
⅝ inch 8·6c
½ inch 9·1c

ROUND AND SQUARE.

1 to 1⅞ inch 4·6c
2 to 2¾ inch 4·9c
3 to 3¾ inch 5·1c
3¾ to 4 inch 5·6c
⅝ to 9-16 inch 5·0c
½ to 7-16 inch 5·3c
⅜ inch 5·4c
5-16 inch 5·8c
¼ inch 6·2c
3-16 inch 8·2c

OVAL IRON.

⅞ to 1¼ inch 5·2c
⅝ to ¾ inch 5·4c
½ inch 5·6c
⅜ inch 6·2c

HALF OVAL AND HALF ROUND.

⅞ to 1¼ inch 5·5c
⅝ to ¾ inch 6·0c
½ inch 6·7c
⅜ inch 8·2c

	Boiled.	Charc'l.	Juniata.
Sheet Iron, 10 to 14	6·2	7·7	9·2
" " 15 to 20	6·4	7·9	9·4
" " 21 to 24	6·6	8·1	9·6
" " 25 to 26	6·8	8·3	9·8
" " 27	7·0	8·5	10·0

All [illegible]cets over 28 in. wide, ½c. ⅌ ℔ extra.

TANK IRON.

3-16, ¼ and ⅝ inches thick 6·0
Boiler Plate Iron 7·9
Heads not flanging 7·1
Heads flanging 8·9
Plow Slabs 6·8
Plow Wings 7·3

RAILROAD IRON—COUNTERSUNK AND PUNCHED.

1¼ by ⅜, 7-16 and ½ inch 5·6
1¼ by ¼ and 5-16 inch 6·1
1½, 1¾ and 2 by ½ and ⅝ inch 5·1
1½ by ⅜ inch 5·3

EXTRAS FOR CUTTING TO LENGTH.

Flat bars and rounds and squares 1c
Flat bars for tire 1c
Heavy bands 3c
Light bands and wagon box iron 4c
Hoops 5cc

TERMS.

Note or acceptance at sixty days, with currant rate of exchange on New York, or a discount of 2 per cent. for cash, if remitted within fifteen days of date of invoice. Payment to be made in New Bork exchange, United States Treasury notes, or their equivalent. No discount on bills of less than $50.

Heavy Hardware.

The following are the card rates of Lewis, Oliver & Phillips:

Iron, standard list, assorted sizes, for large orders, 4·6c, card rate, 2 % off net.
Iron wedges 7½c ⅌ ℔ net
Norway Nail rods 9½c ⅌ ℔ net
Fence Pickets—
⅝ round, bent to shape 40c ⅌ ft. fence, less 10 %
Discount off Standard List.
Carriage and tire bolts 60 % off net
Plow blots 15 % off net
Stove bolts list net
Machine and square head bolts new list 15 % off net
Coach and lag screws, new list 15 % off net
Bolt Ends, new list 15 % off net
Square and hexagon nuts and washers, new list 2½c ⅌ ℔ off net
Washers new list, 4c ⅌ ℔ off
1c. ⅌ ℔ extra for less than 1 keg of each size.
Harrow teeth, in lots of 1 ton or more, 1 in. diam 6c; ¾ & ⅞ in. diam. 6c; ⅝ in. diam. 6½c ⅌ ℔.
Patent Headed Harrow Teeth, packed in casks ½c extra ⅌ ℔ net.
Skein bolts, in bulk, in lots of 1 keg or more, ⅝ in. diam. 9½c; 9-16 in. diam. 10½c; ½ in. diam. 11½c. 1c. ⅌ ℔ extra when less than 1 keg of each size is ordered.
Screw Hook-and-Eye Hinge, ¾ to 1 in. diam. 10½c; ⅝ in. diam. 11½c; ½ in. diam. 13½c ⅌ ℔, net.
Screw and Strap Hinges, in lots of 50 pairs or more, 14 to 36 in. long, 8c; 8, 10 and 12 in. long, 9½c ⅌ ℔ net.
Strap and T Hinges net list
6 months purchases over $1000, 5 % dis. allowed.
Screw hitching rings $7 50 ⅌ 100 net
Duck nest tuyere irons $17 00 ⅌ doz. net
Cast iron washers 5½c ⅌ ℔ net
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 feet long ⅌ ℔ 6c
1 to 2 in. diam. from 4 to 8 feet long 6½c
1 to 2 in. diam., from 1½ to 4 feet long 7c
⅝, ¾ and ⅞ in diam., over 4 feet long 7½c
⅝, ¾ & ⅞ in diam., from 1½ to 4 feet long 7¾c

WAGON HARDWARE.

Wagon Box Strap Bolts—
10 in. long by 7-16 at screw end, ⅌ set of 8 bolts 55c
12 " " ½ " ⅌ " 8 " 70c
12 " " ⅝ " ⅌ " 8 " $1 00
14 " " ⅝ " ⅌ " 8 " 1 10
16 " " ⅝ " ⅌ " 8 " 1 20
5 cts. ⅌ set for each additional inch over 14 inch, by ⅝. All lengths made.
Wagon Box Rods, narrow track each 18c
Wagon Box Rods, wide track, each 20c
Single Tree Irons, per set of four pieces 38c
Wt. Iron Bolster Plates, 2¾ in. wide, per set 60c
" " " 3 " " 65c
" " " 3¼ " " 70c
" " " 3½ " " 75c
Wagon Brake Ratchets 10½c each
" " " finished with guard 45c each
Wrought rub irons 11c each
Wrought Hammer Straps, heavy pattern 16c each
" " " light pattern 13½c each
Stay Chain Hooks 8c each
Single Tree or End Clips each 9c
Double or Center Clips, light each 10c
" " " " heavy each 12c
Strap Bolts, Rods, Single Tree Irons, Bolster Plates, Brake Ratchets, Hammer Straps, Rub Irons, Stay Chain Hooks and Clips, in lots of 50 set 15 % dis.
Wagon Box Staples, 1⅛ to 2⅛ in. to clinch per 1000, $16 50 net
Wagon Box Staples, Box Iron, to rivet on, per 1000, $11 50 net
Neck Yoke Eyes, each 5¼c net
Neck Yoke Eyes, with ⅜ inch rings 8¼c net
King Bolts, ⅞, 1, 1⅛, and 1¼ in. diam. ⅌ ℔ 6c
Wagon Rivets, ex. large, oval and steeple head, ¼ in. diam., all lengths, ⅌ ℔ 11½c
Wagon Rivet, 3-16 inch diam., all lengths 13½c
Wagon Rivets & nails in 5 ℔ paper boxes, ⅌ ℔ ex 1c
Wagon and Hinge Nails, ⅌ ℔ net 17½c
Coupling Plates / Double Tree Plates / Tongue Plates } 10c ⅌ ℔ net
Neck Yoke Plates ⅌ ℔ 13c
Tongue Cap Iron, 1¾, 2 and 2¼ in. wide, same price ⅌ ℔ as Band Iron.
Wagon Chains, Stay Lock and Tongue 5-16 in., 13½c; ¼ in., 14½c.

Nails, Brads, Spikes, etc.

CUT NAIL LIST.

10d to 60d nails, fence, and brads $5 50
8d and 9d nails, fence and brads 5 75
6d and 7d nails, fence and brads 6 00
4d and 5d nails, fence and brads 6 25
3d nails, fence and brads 7 00
2d nails, fence and brads 8 25

TOBACCO.

FINE BLUED.		BARREL.	
3d	$8 25	1⅛ inch	$6 25
2d	9 25	1⅜ inch	6 50
LINING.		1¼ inch	7 00
7-8	10 00	1⅛ inch	7 25
CASING.		1 inch	8 00
10d to 50d	6 25	⅞ inch	8 50
8d	6 50	FINISHING.	
6d	6 75	10d to 50d	6 75
4d	7 00	8d	7 00
		6d	7 25
		4d	7 50

Cut spikes, all sizes 5 75
Cut boat spikes 6 25
Clinch nails, all sizes 6 25

TERMS.—Sixty day's time, or two per cent. discount if remitted within ten days from date of invoice. Prices subject to changes in market without further notice.

LENGTH OF NAILS.

2d, 1 inch; 3d, 1¼ inch; 4d, 1½ inch; 5d, 1¾ inch; 6d, 2 inch; 7d, 2¼ inch; 8d, 2½ inch; 9d, 2¾ inch; 10d, 3 inch; 12d, 3¼ inch; 16d, 3½ inch; 20d, 4 inch; 30d, 4½ inch; 40d, 5 inch; 50d, 5½ inch; 60d, 6 inch.

BOSTON.

Corrected by Fuller, Dana & Fitz, 110 North St., Boston, Importers and Commission Merchants.

Tin Plates.

I. C. Charcoal per box @ 14 00
" Coke " @ 13 00
" Terne " @ 12 50

Metals.

Pig Tin, Banca, gold per lb. 37½c
" Straits, " " 31½c
" English, " " 31½c
Copper, Sheathing " 43c
" " yellow " 33c
Copper Bolt " 45c
" Braziers " 45c
" Ingot " 37c
" Old "
Lead, Spanish Pig, gold " 6¾c
" Sheet and Pipe " 9·45c
" Old " 6¾c
Spelter, Silesian, gold " 7¼c
" American, " " 6½c
Zinc, Sheet " 10½c

Iron.

Sheet Iron, Russia, gold per lb. 18c
" English " 7c @ 7½c
" American " 8c
" Galvanized " 11c @ 13c
Swedes Bar Iron, Flat, gold. per ton, $135 00 @ $145 00
" Shoe Shapes, " " 150 00 @
Norway Bar Iron, Flats, " " 135 00 @ 145 00
Norway Shapes, gold, per ton, 150 00 @
Norway R'd, 2 in. to ¾ in. gld. pr. ton 140 00 @
" " 11-16 to ⅜ in." " 157 50 @
" " 5-16 to ¼ in." " 160 00 @
" Nail Rods, Roll'd" " 172 50 @
" " U B. " " 167 50 @
" " Benzon " " 162 50 @
" " Vasa, " " 157 50 @
" " Ne, " " 152 50 @
English Refined Bar Iron, " 100 00 @
Scotch Pig Iron, " 52 00 @ 55 00
American " " 45 00 @ 52 00
Wrought Scrap Iron, " 42 00 @ 45 00

Steel.

English Tool Steel, gold per lb. 16c.
" Machinery Steel, gold " 10c.
American Tool " " 16c.
" Machinery " " 11c
Bessemer Steel 8½ @ 9½c
German " per lb. 10½c.
Spring Steel " 9c.
Tire " " 8c.
Sleigh Shoe Steel " 6¾c.
Toe Calk " " 8¾c.

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.

Jan. 7d, 1873.

Axes, Chopping—Blood's $12 50 @ 14 50
Augers—C. S. cut. dis 25 %
Bits, Auger—Pierce's 25 %
Jennings' dis 10 %
Bells, Cow—Yaw's Genuine net
Bells, Hand dis 50 @ 50&10 %
Bellows—Smiths' dis 15 @ 20 %
Moulders' dis 10 %
Bolts—Carriage and Tire, dia. neck dis 60 & 10 %
Braces, Bit—Barber's dis 30 & 10 %
Spofford's Patent dis 37½ %
Brads, Cut dis 50 @ 50&7½ %
Boards—Stove, Brooks' Patent, new list dis 30 %
Buckets—Well per doz $6 00
Butts—Brass dis 25 %
Cast Loose Joint dis 40 %
" " Pin dis 30 %
" " " Japanned dis 30 %
" " " Silver Tipped dis 20 %
Wrought Narrow net
" Broad, Loose Joint dis 15 %
" Table and Back Flaps net
Belting—Rubber dis 30 @ 33⅓ %
Leather, new list, dis 30 @ 30 & 5 %
Beaters, Egg, "Peerless" per doz $4 00
Brick—Bath (box of 2 doz) Best English $1·50
"Rutherford" $1 25
Bung Borers—"Enterprise" dis 20 %
Chalk—White, Carpenter's per gross, 50c
Blue, Carpenter's " " $1 00
Crayon School " " 14c
Chisels—Firmer Socket dis 60 @ 60 & 5 %
Framing Socket dis 60 @ 60 & 5 %
Corner Socket dis 60 @ 60 & 5 %
Slick's Carpenters' dis 60 @ 60 & 5 %
Castings—Malleable ⅌ ℔, 11c
Cutters, Meat—Hale's Patent dis 10 %
Cherry Seeders per doz $9 00

Elbows—Corrugated	5	5½	6	7	
Charcoal	$4·25	5·25	5·25	6·50	} dis 10 %
Russia	10·00	13·00	13·00	14·00	

Faucets—Wood, Cork Lined dis 50 @ 50&10 %
Files—Wheeler, Madden & Clemson's dis 42½ %
Freezers, Ice Cream—"Champion" dis 33⅓ %
Gates—Molasses—
Patent Self-Measuring ⅌ doz. $42 00; dis 20 %
Hinges—Window Blind—"Shepard's" dis 30 %
"Standard" dis 30 %
Wrought Strap and T list net
Hods, Coal—Plain, Black and Galvanized new list net
Funnel, Black and Galvanized new list net
Fancy and Helmet new list net
Hammers—Maydole's net
Yerkes & Plumb's dis 5 @ 10 %
Hatchets—Blood's net @ 5 %
Hooks and Staples—Wrought 50&10 @ 60 %
Hooks—Belt dis 45&10 %
Hasps and Staples—Wrought dis 50&10 %
Sad Irons ⅌ ℔ 5½c
Kettles—Brass ⅌ ℔, 52½c
Enameled dis 30 %
Knives, Drawing—Oval No. 1 dis 60 @ 60 & 5
Razor Blade dis 50 %
Corn, Greenwood's dis 25&5 %
Lanterns "Peerless" No. 1 5 10
⅌ doz $26 00 $12 50 $15 00 dis 10 %
"Radiant" 75 100 150 175
⅌ doz $13·13 13·13 22·50 22·50 dis 20 %
Knobs—Door, R. & E Mfg Co. dis 20 @ 25 %
Locks—Door, R. & E Mfg. Co. dis 20 @ 25 %
Machines—Apple Paring, Turn Table / " " Lightning } $8·50 ⅌ doz
Tinmen's
Doweling, Merchant's, No. 1 " 4 75
" " No. 2 " 5 00
Mills, Coffee—Box and Slide, common dis 10 %
Box Union and Eagle dis 5 %
Swift's Patent dis 10 %
"Champion" dis 20 %
Nails—Cut, Chesapeake $5 25 rates
Clout and Finishing list @ dis 7½
Shoe list @ dis 7½ %

Horse, Ausable	No. 5	6	7	8	9	10
	30	27	25	24	23	22c

" " 1000 lbs dis 5 %

" Clinton	No. 6	7	8	9	10
	23	21	20	19	18c

Packing—Rubber dis 30 @ 33⅓ %
Pencils, Slate—Soapstone 4 5 6 in. 30 40 50c. per 100
Case lots dis 20 %
Paint—White Lead, U. S. Gov't. ℔ 9½c
Rivets—Iron, Black and Tinned dis 20 @ 25 %
Copper 5 @ 10 %
Rope—Manilla, ½ inch and larger ⅌ ℔ 18c
Rules—Boxwood and Ivory dis 30&10 %
Staples—Blind, Boardman's Pat., ½ & ⅝ ⅌ ℔ 37c
Skates—White's dis 20 %
Straps, Skate—Russet and Black net @ 20 %
Spoons—Iron Tinned dis 10 %
" " by the case dis 20 %
Plated Rogers' A No. 1 dis 25&5 %
Squares—Steel and Iron list net
Shoes, Horse—H. Burden & Sons ⅌ keg $7 00
Shovels & Spades—Shepard, Forsyth & Dennison dis 5 %
Saws—Henry Disston & Sons dis 5 %
Scales—Buffalo Scale Works dis 25 %
Fairbanks dis 15 %
Screws—National Screw Co. { Iron dis 50 % / Brass dis 40 %
Shears—Seymour's dis 50 %
Scythes—Greenwood's dis 25&5 %
Tools—Tinmen's
Traps, Steel—Newhouse dis 17½ %
Tacks—Half Weight Am. Iron dis 70 @ 70&7½ %
Vises—Parallel, Buffalo dis 15 %
Wrenches—Coes' genuine dis 25 %
Coes' Imitation dis 45 & 10 %
Tafts' Pattern dis 62½&10 %
Ware—French, Tinned and Iron dis 20 %
Stamped and Japanned net
Cast iron Hollow dis 20@30 %

METALS.

Tin Plates, Charcoal IC.

10x14 $13 25
12x12 13 75
12½x17 12 75
14x20 14 25
14x20 terne 12 00
20x28 " 27 00
Add for each X 2 50
Pig Tin—Straits 40 @ 41c
Banca 47 @ 48c
Solder No. 1 24c, No. 2 22c { 50 lbs. deduct ½c / 100 " " 1c
Sheet Zinc, "Lasalle," 1000 $10 75, 500 $10 85, 100 ℔ casks $11 05 ⅌ 100 ℔s
Iron Wire—Bright and annealed dis 10 @ 20 %
Coppered dis 5 @ 15 %
Tinned dis 5 @ 15 %
Tinned Broom Nos. 20 to 22 ⅌ ℔ 16½
Copper—Sheathing 14@18 oz ⅌ ℔ 43c
Planished ⅌ ℔ 49 @ 51c
Bottoms ⅌ ℔ 45c
Bolts ⅌ ℔ 45c
Braziers' Sheets ⅌ ℔ 45c

Sheet Iron—W. D. Wood & Co.'s	Smooth	Char.	Jun
Nos. 10 to 14	6·45	7·95	9·65c
Nos. 15 to 20	6·95	8·35	9·85c
Nos. 21 to 24	7·15	8·55	10·05c
Nos. 25 & 26	7·35	8·75	10·25c
No. 27	7·55	8·95	10·45c

Am. Russia A. 15c B. 12c
Gen. Russia, No. 1 stained 19c
" " " clean 20c
Galvanized dis 20 %

CHICAGO.

Reported by Markley, Alling & Co., Dec. 1872.

AUGERS AND BITS.

Ives', extra C. S. dis 20 %
Jenning's net list
Cooks' dis 25 %
Snell's dis 7½ %
Snell's Car Bits net list

AXES.

Amoskeag Yankee ⅌ doz $13 50
" Crescent " 14 00
Hunt's Yankee " 14 50
Kennebeck Yankee " 12 00
Lippincott " " 12 50
" Crown " 13 00
" Beveled " 13 00
Jefford's Silver Steel " 13 00
Red Warrior, Beveled " 14 00
Kennebeck, Handled " 15 00
Boy's, Handled " 12 00

BOLTS.

Carriage and Tire dis 50&20 %
Cast Barrel and Shutter dis 20&10 %
Wrought Iron Barrel add 10 %
" " Square net list

BUTTS.

Cast Fast Joint, Narrow dis 10 %
" " " Broad dis 20 %
" Loose Joint dis 35 %
" " Pin, Reversible dis 25 %
" " Japanned dis 25 %
" " Silver Tipped dis 25 %
Wrought Narrow, Fast Joint net list
" Broad, Fast Joint dis 15 %
" " Loose Joint dis 15 %
" Loose Pin dis 15 %
" Table net list
" Brass dis 15 %
Garretson's Blind Butts, Wood doz sets $2 00
" " " Brick doz sets 3 00
Parker's " " Wood doz sets 2 45
" " " Brick doz sets 3 50

CASTERS.

Iron Plate dis 20 %
Brass Wheel Plate dis 20 %
Porcelain Wheel Plate dis 20 %
" " Bed dis 20 %
Iron Wheel Bed dis 20 %

CHISELS.

Butcher's Tanged Firmer dis 30 %
" Long Paring dis 30 %
Witherby Socket Framing dis 50&15 %
" " Firmer dis 50&15 %
" " Corner dis 50&15 %
" " Slicks dis 50&15 %

COFFEE MILLS.

Box 4 Iron $ 3 75
" 103 " 5 25
" 102 " 7 50
" 107 Britannia 7 50
" 106 " 9 25
" 25 Union 11 00
" 35 " 13 00
" 75 Cast Steel 11 00
" 85 " 13 00
Side 50 4 75
" 60 5 75
" 70 7 25
" 90 18 00
" 15 Union 7 00
" 20 " 8 00

CUTLERY.

American Table dis 20 %
" Pocket dis 25 %

DOOR SPRINGS.

Torry ⅌ doz $7 50
Rubber " 4 00
Boon's " 5 00

DRAWING KNIVES.

Witherby Tool Co. dis 50&15 %
Ohio Tool Co. net list

FILES.

Butcher's $7 00 £
Nicholson's $5 00 @ $5 50 £

HAMMERS.

Maydole's net list
Yerks & Plumb net list
Cheney net list

HANDLES.

Extra Axe ⅌ doz $3 00
No. 1 Axe " 2 25
No. 2 Axe " 2 00
R. R. Pick, No. 1 " 2 00
Coal " " " 2 00
Sledge, No. 1 " 2 00
Hatchet " 65
Hammer, A. E. " 65

HATCHES.

Amoskeag Shingling, No. 1 ⅌ doz $7 25
" No. 2 " 8 00
" No. 3 " 8 75
" Claw, No. 1 " 7 75
" " No. 2 " 8 50
" " No. 3 " 9 25
" Lath, No. 1 " 7 50
" " No. 2 " 8 25
" " Solid Steel " 12 00

HINGES.

Strap and T dis 5 %
Screw Hook and Strap, 8 to 12 in. net, 10c ⅌ ℔
" " 14 to 24 in. net, 9c ⅌ ℔
Hook and Eye Hinges net 12c @ 16c ⅌ ℔
Gate, No. 35, State ⅌ doz $3 5
" No. 3, In and Out " 3 50
" Blinn's Pat " 7 50

HORSE NAILS.

Northwestern, 8d 24c
Ausable, 8d 24

KETTLES.

Brass net 55
Enameled dis 15

LOCKS AND KNOBS.

Norwalk Lock Co. dis 20 %
Branford " dis 20 %
Eagle " dis 15 %
American Pad Locks dis 25 %
Continental Lock Co. dis 10 %

MEAT CUTTERS.

Haven's Patent net list
Hale's " dis 10 %
Woodruff " net list
Stowe's Sausage Stuffers net list

MOLASSES GATES.

Stebbin's Patent dis 40 %
Enterprise " dis 5 %

OIL STONES.

Washita No. 1 net 35c ⅌ ℔
" Slips net 65c "
Hindostan No. 1 net 9c "
" Axe net 10c "
" Slips net 15c "

PICKS AND MATTOCKS.

Picks, Railroad, Axe Finish ⅌ doz, $13 00
" Coal, Axe Finish " 10 00
Mattocks, L. C., Axe Finish " 16 00
" S. C. " " 15 50
Grub Hoes, Axe Finish, No. 2 " 12 00

PLANES.

Ohio Tool Co. Bench net list
Sciota dis 10 %
A. Howland & Co. Bench net list
" " Fancy net list
Bailey Patent Iron dis 15 %
Plane Irons, Butcher's dis 30 %

RIVETS.

Iron dis 10 @ 15 %
Tinned dis 10 @ 15 %
Copper, No. 7 net, ⅌ ℔, 60c

RULES.

Stanley Rule and Level Co. dis 30 %
Hubbard & Curtiss Mfg. Co. dis 30 %

SAD IRONS.

Best A No. 1 ⅌ ℔, net, 5⅛c
" Copper Face Star " 6c

SANDPAPER.

Wiggin & Stevens, No. 0 to 1½ ⅌ ream, net, $4 50
" " No. 2 to 3 " " 5 00

SASH LOCKS.

Champion ⅌ gross, net, $12 00
Hopkins & Dickinson dis. 10 %
Judd's Patent dis. 10 %
Corbin's Patent dis. 10 %
Clark's " dis. 20 %

SAWS.

H. Disston & Sons dis. 10 %
Champion X Cut ⅌ foot, net, 60c
M. A. & Co. X Cut " " 50c

SCREWS.

American Screw Co.—Iron dis 45&5 %
" " —Brass dis 25 %
" " —Blued Rd. Head dis 25 %

SHOVELS AND SPADES.

Ames' Black Shovels ⅌ doz, $15 00
" Polished " " 16 00
" Patent " " 18 00
Alling " " " 15 00
" " " Molders' " 18 00
Crane's Black " " 12 00
" Polished " " 13 00
Smith's " " B. S. L. H. Rd. Pt. " 13 50
" " " B. S. D. H. Rd. Pt. " 14 00
Ames' Black Spades " 16 50
" Polished " " 17 50
" Patent " " 18 00
Alling " " 15 50
Crane's Black " 12 50
" Polish'd " 13 50

SCOOPS.

Alling Steel Polished, No. 2 ⅌ doz, $14 00
" " No. 3 " 14 50
" " No. 4 " 15 00
" " No. 5 " 16 00
" " No. 6 " 17 00
" " No. 7 " 18 00
" " No. 8 " 19 00
" " No. 10 " 22 00
Crane's Polished, No. 5 " 14 00
" " No. 6 " 15 00
" " No. 7 " 16 00
" " No. 8 " 17 00
Crane's Black Coal, No. 4 " 18 00
" " No. 5 " 18 50
Preston, Black Scoops No. 1 ⅌ doz $12 00
" " " " 2 " 12 50
" " " " 3 " 13 00
" Half Pol. Scoops No. 1 " 13 00
" " " " 2 " 13 50
" " " " 3 " 14 00
Lippincott, Half Pol. No. 2 " 16 00
" " " 3 " 17 00

WRENCHES.

Taft's dis 60 %
Coe's Imitation dis 45 %
Coe's Genuine dis 25 %

WRINGERS.

Novelty Clothes Wringer ⅌ doz $72 00
Universal " " 72 00
Mead's " " 75 00

Iron. (Pittsburgh classifications.)

Flat Bars ⅌ ℔ 5·0 @ 5·4
Heavy Bands 5·6 @ 6·2
Light Bands 6·0 @ 7·2
Hoops 6·3 @ 9·5
Rounds & Squares 5·0 @ 8·6
Ovals 5·2 @ 6·6
Half Ovals & Half Rounds 5·9 @ 8·6
Horse Shoe 6·5

SHEETS.

No. 10 to 14 6·6
No. 15 to 20 6·8
No. 21 to 24 7·0
No. 25 to 26 7·2
No. 27 7·4

Nails.

10d to 60d..per keg	$5 62½	8d....per keg	$7 12½
8d and 9d	5 87½	10d	6 87½
6d and 7d	6 12½	12d	6 87½
4d and 5d	6 37½	2d	8 37½
3d	7 12½	3d fine	8 37½
Casing Nails—		Clinch	7 87½
6d	6 87½	Cut spikes	5 87½
8d	6 62½	Barrel—	
10d	6 37½	⅞ inch	8 37½
12d	6 37½	1 inch	7 87½
16d	6 37½	1⅛ inch	7 12½
Finishing—		1¼ inch	6 87½
6d	7 62½	1½ inch	6 12½

HORSE NAILS.

Northwestern, Nos.	5	6	7	8	9	10
Cents ⅌ ℔	30	27	25	24	23	22
Ausable	30	27	25	24	23	22

Pig Iron.

Scotch—
Gartsherrie $ @ 65 00
Coltness @ 65 00
Summerlee @ 64 00
Glengarnock @ 64 00
Eglinton @ 63 00
Carnbroe @ 63 00
Calder @ 64 00
Dalmellington @ 63 00
Langloan @ 63 00
Monkland @ 62 00
Clyde @ 62 00
Govan @ 60 00
Charcoal—
Lake Superior No. 1 @ 62 00
" " 2 @ 61 00
Stonecoal—
Chicago, No. 1 @ 57 00
" " 2 @ 56 00
Missouri " 1 @ 58 00
Massilon No. 1 @ 63 00
No. 1, Grand Tower @ 57 00
No. 2, " @ 56 00
Car-wheel—
Salisbury, all numbers @ 70 00
Champion @ 61 00
Red River @ 65 00

Steel.

THREE 1st CLASS PRIZE MEDALS. CLASSES 1, 21, 22, Great Exhibition of Industry, LONDON, 1851.

MEDAL OF HONOUR, SOCIETY OF ARTS & INDUSTRY, LONDON, 1856.

1st CLASS PRIZE MEDAL, CLASS 14 UNIVERSAL EXHIBITION OF INDUSTRY PARIS, 1855.

COCKER BROTHERS,

SUCCESSORS TO

SAML. COCKER & SON,

(Established 1752.)

SHEFFIELD. ENGLAND

MANUFACTURERS OF

CAST, SHEAR, SHEET, AND BLISTER STEEL, OF EVERY DESCRIPTION.
BEST CAST STEEL WIRE, ADAPTED SPECIALLY FOR MECHANICAL PURPOSES;
Also for ROPES, NEEDLES, FISH HOOKS, PINS, CRINOLINE, &c.

BEST CAST STEEL FILES, SAWS, EDGE TOOLS,
HACKLES, GILLS, CARD CLOTHING, CARD TEETH, HACKLE AND GILL PINS,
FISH HOOKS, NEEDLES. &c.

ALSO

GENERAL MERCHANTS.

Agent, JONATHAN HATTERSLEY, Cincinnati, Ohio

WM. JESSOP & SONS,

MANUFACTURERS OF

STEEL,

AND IMPORTERS OF IRON,

SHEFFIELD, ENGLAND.

PRINCIPAL DEPOTS:

NEW YORK, Nos. 91 and 93 John Street.....BOSTON, Nos. 133 and 135 Federal Street.

AGENCIES:

PHILADELPHIA, Jas. C. Hand & Co .....PROVIDENCE, Cornett, Nightingale & Co.
CHICAGO, Crerar, Adams & Co.....ST. LOUIS, Henry Bakewell & Sons.
CINCINNATI, Augustus Wessel.....NEW ORLEANS, Folger & Co.
SAN FRANCISCO, Russell & Erwin Manufacturing Co.

F. W. MOSS,

Successor to JOSHUA MOSS & GAMBLE BROTHERS,

MANUFACTURER AND IMPORTER OF

STEEL AND FILES.

Principal Depots: 80 John Street, New York, and 512 Commerce Street, Philadelphia.

MOSS & GAMBLE SUPERIOR C. S. "FULL WEIGHT" FILES,
" Cast Steel Hammers and Sledges. Also, "M. & G." Anvils and Vises.
" WARRANTED CAST STEEL, especially adapted for DIES and TURNING TOOLS, DRILLS, COLD CHISELS, PUNCHES, and all kinds of MACHINISTS' TOOLS.
" Celebrated Improved Mild Centre Cast Steel, for Taps, Reamers, and Milling Tools, warranted not to crack in hardening Taps of any size.
" Swede Spring Steel, especially adapted to Locomotive and Railway Car Springs.
" English Spring and Plow Plate Steel.
Also, manufacturer of
Sheet Cast Steel, Shear, German, Round Machinery, Hammer, Fork and Shovel Steel
And GENERAL MERCHANT.

A. M. F. WATSON, General Agent.

WILSON HAWKSWORTH, ELLISON & CO.,

MANUFACTURERS OF

STEEL, STEEL WIRE, &C.,

AND GENERAL MERCHANTS,

CARLISLE WORKS, SHEFFIELD, ENGLAND.

AGENCIES:

New York, 72 John Street.
Philadelphia, 505 Commerce Street.
Boston, 6 and 8 Liberty Square.

BARROW HÆMATITE STEEL COMPANY

LIMITED.

BARROW IN FURNESS,

LANCASHIRE, England

MANUFACTURERS OF

STEEL RAILS, TYRES, WHEELS,

Axles. Shafting, Boiler and Ship Plates, Bessemer Pig Iron, &c., &c.

CHAS. CONGREVE & SON,

SOLE AGENTS FOR THE U. S.,

104 and 106 John Street, opposite Cliff Street, NEW YORK.

J. & RILEY CARR,

MANUFACTURERS OF SUPERIOR

STEEL

For Tools, Cutlery, Saws, Files, Augers, Gimblets, &c.; Sheet Cast Steel for SPRINGS AND STAMPING COLD;

ALSO THE CELEBRATED

DOG BRAND FILES,

Unsurpassed, if equaled, in quality.

Bailey Lane Works, Sheffield, England.

Warehouse, 92 John St., New York.

Established 1810.

[illegible] MOORE, Attorney.

Steel.

SANDERSON BROTHERS & COMPANY,

(LIMITED)

MANUFACTURERS OF THE

CELEBRATED CAST STEEL,

WARRANTED MOST SUPERIOR FOR TOOLS.

DARNALL WORKS,
ATTERCLIFFE FORGE,
WEST STREET WORKS, } SHEFFIELD, ENGLAND.

IMPORTERS OF FILES,

AND

AGENTS FOR ARMITAGE'S GENUINE MOUSEHOLE ANVILS.

NEW YORK, Edward Frith, 16 Cliff.
BOSTON, H. L. Richards, 18 Batterymarch.
PHILADELPHIA, Wm. H. Sowers.
CLEVELAND, O., Cleveland, Brown & Co.
NEW ORLEANS, Rich'd Rhodes, 71 Camp.
BALTIMORE, Md., Wm. H. Cole.
MONTREAL, Saint Paul St.
NEW HAVEN, Ct., Atwater, Wheeler & Co.

FRANCIS HOBSON & SON,

97 John Street, NEW YORK,

Sole Manufact'rs of **"CHOICE"** Extra Cast Steel.

Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.

Don Works, Sheffield, England.

JOHN HOGAN, Agent.

S. & C. WARDLOW,

MANUFACTURERS OF THE CELEBRATED

Cast and Double Shear

STEEL,

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table, Carving, Butcher and Shoe Knives, Turning Tools, Dies, Files, Clock or other Springs, Saws and Tools of every variety.

SHEFFIELD, ENGLAND.

Office of S. & C. WARDLOW, 13 Gold Street, New York.

In calling the attention of consumers of Steel in any of the varieties above enumerated, we would respectfully assure them of our ability to supply an article, that cannot be excelled in quality, temper, and adaptation in all respects to the various purposes for which it may be required. Half a century of practical experience in all departments of Steel manufacture, a long established reputation in England, and the Continent of Europe, and in the Eastern States principally of this Country, encourage us to solicit a universal trial of our Steel for the above or other purposes for which a first class material, in quality, temper, and durability is needed.

G. SANDERSON & CO.,

Manufacturers of all descriptions of

STEEL.

Bailey Street and Broad Lane Steel Works, } SHEFFIELD, ENGLAND.

Particular attention is paid to quality and temper for

Files, Saws, Table and Pocket Cutlery, Augers, Shovels, &c.

ALSO STEEL of superior quality for Turning Tools, Taps, Dies, Drills, &c.

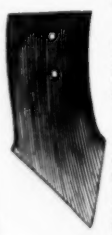
Hot and Cold Rolled Sheets for Clock Springs, Corset Clasps, Pens, &c.

☞ *Makers of the Celebrated ROCK BORING DRILL STEEL.*

Warehouse, 96 John Street, New York.

A. J. NELLIS & CO., Pittsburgh, Pa.

MANUFACTURERS OF



Agricultural Steels and Irons
OF ALL KINDS AND SIZES. BEVELED, BOLTED, FINISHED AND TEMPERED TO SUIT ALL KINDS OF SOIL.

Nellis' Original Harpoon Horse Hay Fork Improved.
Nellis' Grapple & Pulleys.
☞ Send for Pamphlet.

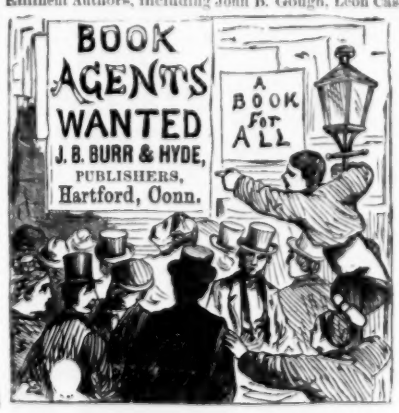
With the exception of our Horse Hay Fork and Fixtures we make no complete Implement. Agricultural Steels and Irons we make a specialty. From the universal approval our goods have secured by actual test in the hands of Implement Makers and Farmers from the Atlantic to the Pacific, and with our facilities, experience and improvements, we frankly assure the Trade of our ability to meet the requirements of the age. All of our Steel Goods have imprint of our Trade Mark.

BOOK AGENTS WANTED

FOR THE

GREAT INDUSTRIES OF THE UNITED STATES.

Being an Historical summary of the Origin, Growth and Perfection of the Chief Industrial Arts of this Country. **1300 Pages and 500 Engravings.** Printed in English and German. Written by 20 Eminent Authors, including John B. Gough, Leon Case, Edward Howland, Jos. B. Lyman, Rev. E. Edwin Hall, Horace Greeley, Philip Ripley, Albert Brisbane, E. B. Perkins, etc., etc.



This work is a complete history of all branches of industry, processes of manufacture, etc., in all ages. It is a complete encyclopedia of arts and manufactures, and is the most entertaining and valuable work of information on subjects of general interest ever offered to the public. It is adapted to the wants of the Merchant, Manufacturer, Mechanic, Farmer, Student and Inventor, and sells to both old and young of all classes. The Book is sold by agents, who are making large sales in all parts of the country. It is offered at the low price of $3·50, and is the cheapest book ever sold by subscription. No family should be without a copy. We want agents in every town of the United States, and no agent can fail to do well with this book. Our terms are liberal. We give our agents the exclusive right of territory. One of our agents sold 133 copies in eight days, another sold 368 in two weeks. Our agent in Hartford sold 307 in one week. Specimens of the work sent to agents on receipt of stamp. For circulars and terms to agents address

J. B. BURR & HYDE, Publishers,
Hartford, Conn., Chicago, Ill., Cincinnati, Ohio.

Steel.

Sheffield Steel Works

(ESTABLISHED IN 1848.)

SINGER, NIMICK & CO.

Pittsburgh, Pa.,

Manufacturers of

Extra Quality Tool

CAST STEEL,

Patent Rolled

SAW PLATES,

All descriptions of

CAST AND GERMAN

Spring and Plow Steel,

ELLIPTIC AND SIDE SPRINGS, SEAT SPRINGS,

AXLES, STEEL TIRE,

Plow Wings, Shares, Cultivators,

REAPER BARS, CROW BARS, &c., &c.

Warehouse, 83 Water and 100 First Streets.

ISAAC JENKS,

Minerva Iron & Steel Works,

Wolverhampton, England,

MANUFACTURER OF

"Jenks' Spring Steel," and Cast Spring Steel,

Also, TIRE, TOE CORK, SLEIGH SHOE, BLISTER AND PLOW STEEL.

VAN WART & McCOY,

SOLE AGENTS,

43 Chambers St., New York.

A full assortment of "Jenks' Spring Steel," in stock.

MILLER, BARR & PARKIN,

Crescent Steel Works,

PITTSBURGH, PA.,

Manufacturers of all descriptions of

STEEL

EQUAL TO ANY IN THE MARKET.

Office.....339 Liberty St.,

PITTSBURGH, PA.

Gunpowder.

GUNPOWDER.

DUPONT'S

Sporting, Shipping, and Mining

POWDER.

DUPONT'S GUNPOWDER MILLS,

ESTABLISHED IN 1801,

Have maintained their great reputation for 70 years. Manufacture the

Celebrated Eagle Ducking, Eagle Rifle and Diamond Grain Powder.

Also, SPORTING, MINING, SHIPPING, AND BLASTING POWDER

of all kinds and descriptions.

For sale in all parts of the country. Represented by

F. L. KNEELAND,

70 Wall Street, NEW YORK.

GUN-POWDER

LAFLIN & RAND POWDER CO.,

21 Park Row, New York,

invite the attention of the the Hardware Trade to their facilities for delivering

BLASTING, MINING and RIFLE

POWDER

IN EVERY PART OF THE UNITED STATES, from having agencies and magazines at all prominent points, beside our works at

Newburg, Saugerties, Kingston, and Catskill, N. Y.; Scranton, Carbondale and Pottsville, Pa.; Baltimore, Md., and Platteville, Wis.

The superiority is well known of our brands of Rifle Powder:

Orange Rifle, Orange Ducking
Lightning, Audubon.

SAFETY-FUSE at wholesale.

Chicago Metal Market.

(Reported by Cragin Bros. & Co., 141, 143 & 145 Lake street.)

CHICAGO, Dec. 2, 1872.

TIN PLATE.	
IC, 10x14, Coke	$13 00
IC, 10x14, Charcoal	14 00
IX, 10x14 "	17 00
IC, 12x12, Coke	
IC, 12x12, Charcoal	14 50
IX, 12x12, "	17 50
IC, 14x20, Coke	
IC, 14x20, Charcoal	15 00
IX, 14x20, "	18 00
IXX, 14x20, "	21 00
IXXX, 14x20, "	24 00
IXXXX, 14x20 "	27 00
IX, 14x14, "	28 50
DC, 100 Plate, "	14 00
DX "	17 00
DXX, "	20 00
DXXX, "	23 00
IC, 14x20, Coke Roofing	
IC, 14x20, Charcoal Roofing	13 50
IX, 14x20, "	16 00
IC, 20x28, "	29 00
IX, 20x28, "	34 00
PIG TIN.	
Large, 60 lb	40c
Small, 30 lb	41c
Bar Tin	42c
ZINC.	
In casks 1000 lbs	11½c
" " 500 "	11¾c
In sheets	12c
Slab	9c
COPPER.	
Copper Bottoms	48c
Sheathing Copper	43c
Planished Copper 14x48	51c
Size, 14x52, 14x56, 14x60 { Nos. 7 8 9 } Plainshed Copper	53c
BRAZIERS' SHEETS, 30x60.	
6 to 8 lbs	53c
10 and 12 lbs	50c
15 to 100 lbs	47c
Ingot Copper	
Bolt Copper	52c
SOLDER.	
Fine, C. B. & Co.'s Brand	25c
Ordinary	23c
Plumbers' Solder, No. 1	23c
" " 2	21c
ANTIMONY	20c
BABBITT METAL	15c to 25c
GALVANIZED IRON Conductor Pipe, per lb	12c

SHEET IRON.

	Common.	Smooth.	Charcoal.
No. 14 to 24	7¼c	8c	9½c
25 & 26	7½c	8¼c	9¾c
27	7¾c	8½c	10c

Add ¼c per lb for 30 in. wide.

GALVANIZED IRON.

No. 16 to 20	15c
" 21 to 24	16c
" 25 & 26	17c
" 27	18c
" 28	20c

Discount, 15 per cent.

RUSSIA IRON.	
Perfect, all numbers	30c
In sheets, 1c. higher.	
AMERICAN RUSSIA.	
A	16c
B	14c
In sheets, 1c. higher.	
BRAZIERS' RODS.	
¼ inch, 10 ft. long, per lb	8c
3-16 " " " "	10c
LEAD.	
Pig	9c
Bar	10c
Lead Pipe, in full coils	11c
" " when cut	11½c
Sheet Lead	11c

CINCINNATI.

Reported by Sellew & Co., Importers and Jobbers of Metals, No. 214, 216 and 218 Main street.

TIN PLATE.	
I. C. 10x14 Charcoal	$14·00 @ 15·00
I. C. 10x14 best Coke	13·00 @ 14·00
I. C. Terne, 14-20	12·50 @ 14·00
I. C. " 20-28	28·00 @ 28·50
I. C. Continuous	27·00
METALS.	

Pig Tin, Banca, none in stock; Straits, 40 @ 41c; English, 40c; Solder, S. & Co., ℔ lb., 24c; A1, 25c; Roofing, 27c.; Lead, Pig, ℔ lb., 7½ @ 8c; Bar, 8½c. @ 9c.

Copper, Ingot, ℔ lb, Planished, 54c; Sheathing, 46c; Bolt, 45c; Brazier, 6 to 9 lb, 51c; 10 to 14 lb, 48c; 14 to 100 lb, 45c; Copper Bottoms, 48c.

Zinc, Cask, 500 to 1000 lbs, ℔ lb, 11 @ 11¼c; Case, 100 lbs, 12c; Slab, 7½c @ 8½c.

Brass, Roll, No. 6 to 30, ℔ lb, 45c; 30 to 38, 50c; 38 to 40, 65c; Wire, No. 0 to 20, 50c; 20 to 25, 60c.

Babbit Metal, Sellew & Co., ℔ lb, 35c; Black Lead, 25c; Market, 15c.

Antimony, ℔ lb, 20c.
Bismuth, ℔ lb, $8·00.
Nickel, ℔ lb, $3·50.

MANUFACTURED IRON.

Bar, per 100 lbs	$5 25 @ 5 75
Sheet, Fo. 24, boiled	7 00 @ 7 50

SHEET IRON.

		Smooth	Smooth
	Com. B.	Fin. S. L. U.	D. Pe'fd.
Russia	℔ lb,	22 @ 23c	
Am. Russia A	"	15 @ 16c	
" " B	"	13 @ 14	
18 to 20	6·3c	7·9c	9·3c
22 to 24	6·5c	8·1c	9·5c
26	6·8c	8·6c	9·7c
27	7c	8·8c	9·9c

GALVANIZED IRON.

Nos. 18 to 20	15c
" 22 to 24	16c
" 25 to 26	17c
No. 27	18c
" 28	20c

Galvanized, 15 % discount in full bundles.
Bar Steel, Silver, ℔ lb 22c; Crescent, 17½c.
Iron Wire, discount, 5 @ 10 %.
Enameled Ware, discount, 15 @ 25 %.

ONE PIECE CORRUGATED ELBOWS.

Charcoal Iron.		Russia Iron.	
4½ inch	℔ doz $3.75	4½ Inch	℔ doz $8.00
5 "	" 4·25	5 "	" 10·00
5½ "	" 5·25	5½ "	" 13·00
6 "	" 5·25	6 "	" 13·00
7 "	" 6·50	7 "	" 14·00

Sheet Iron Bread Pans ℔ lb 12½c.
American Broilers, ℔ doz, $12 @ $15.
Tinmen's Machines, add 5 %.
Sad Irons, ℔ lb., 5½c. @ 6c.
Brass Kettles, Ansonia, 58 @ 54c: L. & G., 50c.

Inside Diameter. Inches.	Wrought Iron Pipe. Per Foot.	Weights of Pipe. Per Foot.
⅛	$ 12	24
¼	12	42
⅜	14	56
½	15	85
¾	25	1·12
1	34	1·67
1¼	48	2·25
1½	60	2·69
2	85	3·66
2½	1·25	5·77
3	1·75	7·54
3½	2·10	9·05
4	2·75	0·72

45 % discount.

ST. LOUIS.

Corrected weekly by Semple, Birge & Co.

ANVILS.	
Armitage	℔ lb, gold, 13c
Peter Wright's	" " 13½c
Wilkinson's	" " 12½c
APPLE PARERS.	
Conqueror	℔ doz $8 50
Lightning	" 8 50
Turn Table	" 8 50
AUGERS AND BITTS.	
Cook's	25 % off list
Ives'	20 % "
Jennings'	5 % "
Snell's	10 % "
AXES.	
Hunt's	℔ doz $14 00 @ 15 00
Lippincott's	" 13 50 @ 14 50
Lippincott's Pioneer	" 14 00 @ 15 00
Simmons'	" 13 50 @ 14 50
AXLES.	
Kritch & Crane Mfg. Co.'s—	
Patent Taper Axles	5 % off list
Swelled Taper Axles	5 % "
Concord Axles	5 % "
Red Jacket Axles	5 % "
Common Axles, 1⅝ inch and upward	℔ lb 9c
" " less than 1⅝ inch	" 9½c
BELLS.	
Troy, Church	℔ lb 55c
Light Brass, Hand	50 % off list
Moore's, Cow	20 % "
BOLTS.	
Arms, Bell & Co.'s Machine	10 % off list
" " " Carriage and Tire	60 % "
Norway Iron Carriage and Tire	45 % "
Cast Iron Barrel, Shutter, &c	30 % "
CAST BUTT HINGES.	
Narrow Fast Joint	15 % off list
Broad Fast Joint	30 % "
Broad Loose Joint	10 % "
Reversible	30 % "
Revers. Japanned and Silver Tipped	30 % "
Loose Joint " "	20 % "
Excelsior Reversible Blind	25&5 % "
Lull & Porter's Blind	25&5 % "
WROUGHT BUTTS.	
Narrow	net list
Reversible	15 % off list
Broad	15 % "
Table Hinges	net list
Back Flaps	net list
Inside Blind Hinges	net list
CASTORS.	
Porcelain Wheel Bed or Plate	30 % off list
Iron or Brass "	25 % "
CHAINS.	

English Coil	3-16	¼	5-16	⅜ 7-16	½ in.	
	15	12½	11¾	18 10⅜	10c.	gold
Trace	6½-10-2				70c.	"
	7-10-2				75c.	"

German Coil and Halter..... new list add 25 %

CHISELS.	
Socket, Firmer or Framing	55 % off list
CLOTHES WRINGERS.	
Colby's	℔ doz $66 00
Novelty	" 72 00
Universal	" 72 00
Monitor	" 72 00
COFFEE MILLS.	
Parker's	net list
P. S. W. & Co.'s	5 % off list
CORN KNIVES.	
Dunn Edge Tool Co.'s Clipper	℔ doz $5 75
Disston's	" 5 75
CROW BARS.	
Steel Pointed	℔ lb 8 @ 10c
Solid Cast Steel	" 20c
CUTLERY.	
J. Russell & Co.'s	
Lamson, Goodnow & Co.'s	15 % off new list
Landers, Frary & Clark's	
FILES AND RASPS.	
Nicholson's Mill Files	$5 50 to the £ currency
Nicholson's Other Files	5 00 to the £ currency
Butcher's Files	7 00 to the £ currency
Heller's Horse Rasps	$10 00 to the £ cur'y less 40 %
FORKS AND HOES.	
Auburn Mfg. Co.'s Hay & Manure Forks	25 % off list
" " " Handled Hoes	20 % "
" " " Planter Eye Hoes	add 15 % to list
Winsted's Planter Eye Hoes	add 15 % "
HAMMERS.	
Yerkes & Plumb	new list net
Masons' Hammers	℔ lb 20c
Smith Hand Hammers	" 22c

HANDLES.

	Extra.	No. 1.	No. 2.	No. 3.
Axe	$2·75	$2·25	$1·75	$1·00
Pick	Extra. $2·50	No. 1. $2·00	No. 1½. $1·75	No. 2. $1·25

Smith & Montross Fork, Hoe and Rake..... 10 % off list
" " " Broom and Mop. $12 @ $18 ℔ M.

HARROW TEETH.	
1 inch iron	℔ lb 6c
¾ and ⅞ inch, iron	" 6½c
½ inch iron	" 6¾c
Barbed or Headed	½c extra
HATCHETS.	
Hunt's	add 5 % to list
Simmons'	5 % off list
HAY KNIVES.	
Lightning	℔ doz, $24 00
Dunn Edge Tool Co.'s	℔ doz $14 50—less 10 %
Fisher's	" 16 50—less 10 %
HINGES.	
Strap and T—St. Louis make	net list
HORSE NAILS.	
Eureka	25c rates
Ausable	22c "
Northwestern	22c "
Eagle	19c "
HORSE SHOES.	
Rhode Island (Perkin's pattern)	℔ keg $7 50
Burden's	" 7 50
Mule Shoes	$1 00 extra
Rhode Island Trotting Shoes	" 7 50
LOCKS AND LATCHES.	
Jones & Nimick's	20 % off list.
Moorehead, Adams & Co	30 % "
Norwalk Lock Co.'s revised list	30 % "
MATTOCKS AND GRUB HOES.	
Klein, Logan & Co.'s Mat'cks	℔ doz. $14 25 @ 15 75
" Grub Hoes, Oval Eye	℔ doz. $11 00 @ 12 50
NAILS.	
Wheeling	$5 60 rates.
PICKS.	
Klein, Logan & Co.'s R. R. and Clay	$12 00 ℔ doz.
" " " Coal	9 75 "
" " " Poll	12 00 "
" " " Stone	16 50 "
" " " Tamping	19 00 "
PLANES.	
Ohio Tool Co.'s	net list
Eastern	5 % off list
SAD IRONS.	
Monitor Brand, Silver Polished	℔ lb 6c
SASH WEIGHTS.	
Standard Solid Eyes	℔ lb 3½c
SAWS.	
Disston's	5 % off list
Spear & Jackson's	$5 00 to £ gold
Hubbard, Lippincott, B. & Co.'s	10 % off list
Branch, Crooks & Co.'s	10 % "
Livingston's Patent Buck	net list
SCREWS.	
American Screw Co.'s revised list	45 % off
$2000 worth in 6 months	2½ % extra
SCYTHES.	
Blood's C. S. & G. S.	net list
Dunn's Edge Tool Co.'s	"
Paris Furnace Co's	20 % off list
Waldron's English	$9 00 to £
SCYTHE STONES.	
No. 1 Indian Pond	℔ gross $ 7 00
Extra Indian Pond	" 7 50
Premium	" 9 50
Diamond Grit	" 13 50

.25 % off

SHOVELS, SPADES AND SCOOPS.	
Ames'	add $1 00 to list
Lippincott's	new list net
Rowland's	net list
SLEDGES.	
Smith Stone or Coal Sledges—	
Steel Face Polished	℔ lb 17c
Solid Cast Steel	" 25c
Striking Sledges	℔ lb extra 1c
SNATHS AND CRADLES	20 % off list
SPRINGS.	
Cleveland Spring Co.'s—	
Carriage and Express	net list
Blue Seat Springs	20 % off list
TACKS.	
Norway Tack Co.'s ½ weight	70 % off list
Brads	50 % "
TRAPS.	
Newhouse Patent	12½ % off list
Reichard's Animal, Wood Bottom	℔ doz $10 00
" Metal Bottom	" 12 00
VISES.	
Solid Box	℔ lb 18c
Wilson Mfg. Co.'s	15 % off list
WRENCHES.	
Coes' Genuine	25 % off list
Coes' Pattern	40 % "
Taft's	50 % "

London Metal Market.

From the Mining Journal.

COPPER.				
Best selected	per ton	93 0 0	98 0 0	
Tough Cake and Tile	"	92 0 0	93 0 0	
Sheathing and Sheets	"	91 0 0	95 0 0	
Bolts	"	100 0 0		
Bottoms	"	101 0 0		
Old (exchange)	"	75 0 0	78 0 0	
Burra Burra	"	98 0 0		
Wire	per lb		0 1 0½	
Tubes	"	0 1 0	0 1 0½	
BRASS.				
Sheets	per lb	0 0 9½	0 0 10½	
Wire	"	0 0 9¼		
Tubes	"	0 0 10¼	0 0 11	
Yellow Metal Sheathing	"	0 0 7¼	0 0 7½	
Sheets	"	0 0 7¼	0 0 7½	
SPELTER.				
Foreign	per ton	23 10 0	24 0 10	
To arrive				
ZINC.				
In sheets	per ton	31 10 0	32 0 0	
TIN.				
English Blocks	per ton	144 0 0		
Ditto Bars	"	145 0 0		
Ditto, refined	"	146 0 0		
Banca	"	145 0 0	146	
Straits	"	134 0 0	136	
TIN PLATES.*				
IC Charcoal, 1st quality†	per box.	1 18		
IX Ditto, 1st quality	"	2 4		
IC Ditto, 2d quality	"	1 16		
IX Ditto, 2d quality	"	2 2 6	2 4	
IC Coke	"	1 13 6	1 15 0	
IX Ditto	"	1 19 0	2 1 0	
Canada plates, per ton	"	24 0 0		
Ditto, at works	"	21 0 0	22 0 0	
IRON.				
Bars, Welsh, in London	per ton.	11 0 0	11 5 0	
Ditto to arrive	"	11 0 0		
Nail rods	"		11 10 0	
" Stafford in London	"	11 12 6	12 10 0	
Bars "	"	11 15 0	12 0 0	
Hoops "	"	13 0 0	14 0 0	
Bars " at works	"	11 5 0	12 0 0	
Hoops " "	"	13 0 0	14 0 0	
Sheets, single	"	14 10 0	15 0 0	
Pig, No. 1, in Wales	"	6 0 0	7 0 0	
Refined metal, ditto	"	7 0 0	8 0 0	
Bars, common, ditto			10 5 0	
Ditto, merchant, Tyne or Tees	"		11 0 0	
Do., Railways, in Wales	"	0 0 0	10 0 0	
Ditto Swd., in London	"	15 10 0		
To arrive	"			
Pig, No. 1 in Clyde	"	5 15 0	6 5 0	
Do., Coltness or Tees	"	4 10 0	5 10 0	
Ditto, Nos. 3, 4, f.o.b. do.	"			
Railway chairs	"	5 5 0	6 0 0	
" spikes	"	12 10 0	14 0 0	
Indian Charcoal Pigs in London	"	7 0 0	8 0 0	
STEEL.				
Swedish, in kegs (rolled)	per ton			
Ditto (hammered)	"	18 10 0	19 0 0	
Ditto in faggots	"			
English, Spring	"	23 0 0	25 0 0	
QUICKSILVER, per bottle		nom.	12 15 0	
LEAD.				
English Pig, common	per ton.	21 15 0	22 0 0	
Ditto, L.S.	"		21 15 0	
Ditto (W.B.)	"	22 10 0	23 0 0	
Ditto, sheet	"		22 15 0	
Ditto, red lead	"	24 10 0		
Ditto, white	"	28 10 0	30 0 0	
Ditto, patent shot	"	24 10 0	24 15 0	
Spanish	"	20 5 0	21 10 0	

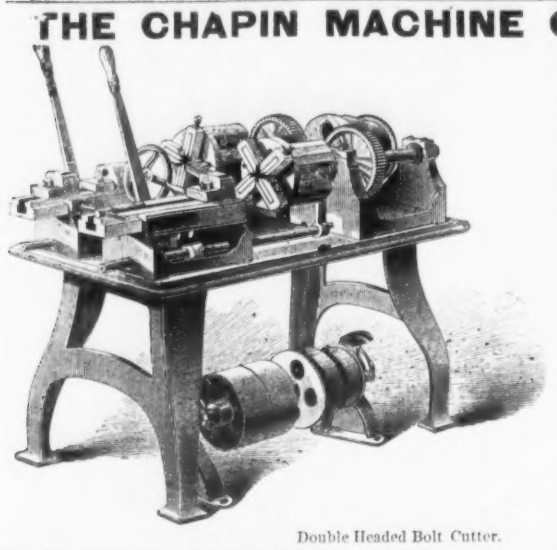
*At the works, 1s. to 1s. 6d. per box less. †Add 2s. for each X.

Terne Plates 2s. per box below Tin Plates of similar brands.

Machinery, &c.

THE CHAPIN MACHINE COMPANY,

NEW HARTFORD, CONN.



Double Headed Bolt Cutter.

Manufacturers of the latest improved

BOLT MACHINERY,

Double and Single Head Bolt Cutters,

Will cut from 5000 to 10,000 per day.

Chapin Header

Will head from ¾ iron down. Will head 10,000 Bolts per day.

Send for Circular.

BUSH HILL IRON WORKS,

Corner 16th & Buttonwood Streets,

PHILADELPHIA.

JAMES MOORE,

(Successor to MATTHEWS & MOORE,)

Engineer, Machinist, Founder and Boilermaker,

CASTINGS of every description.

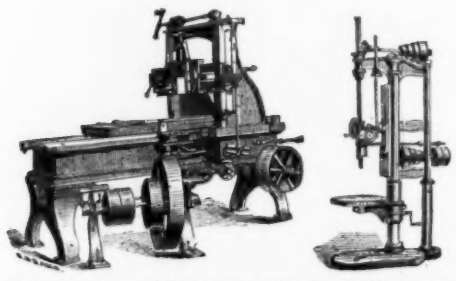
ROLLING MILL AND FURNACE EQUIPMENTS COMPLETE.

Rolls Turned for Rails, Beams, Angles, and all shapes for Iron, Steel, or Composition Metals.

Sugar Mill, Saw Mill and Grist Mill Machinery.

AND MILLWRIGHTING IN GENERAL.

BOILERS---FLUE, TUBULAR AND CYLINDER, and all kinds of TANK AND PLATE IRON WORK.



MACHINISTS' TOOLS

Of excellent designs and workmanship, complete, with best modern attachments. Gun and Sewing Machine Machinery and Fixtures in great variety. Friction Clutch Pulleys.

Water-Power Organ Blowing Apparatus, Special Machinery, &c., made by

THE PRATT & WHITNEY COMPANY, Hartford, Conn.

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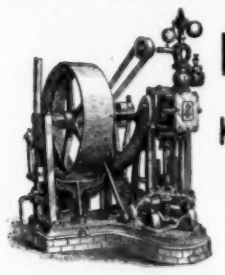
AND



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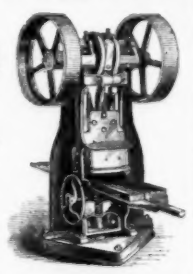

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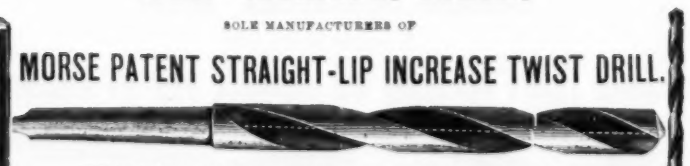

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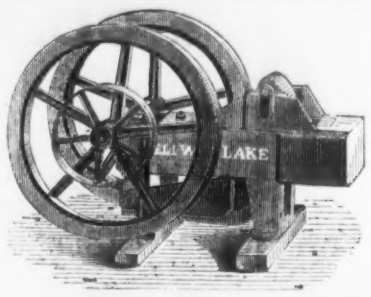

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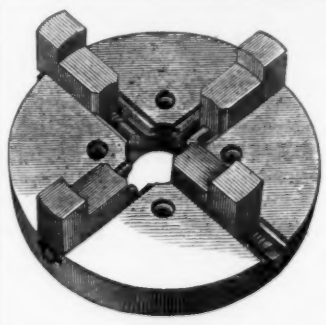

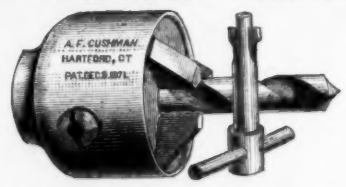

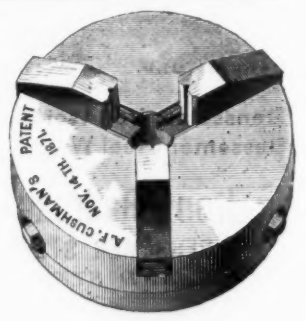

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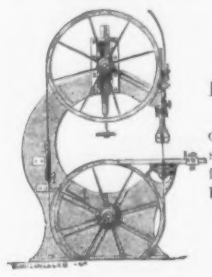

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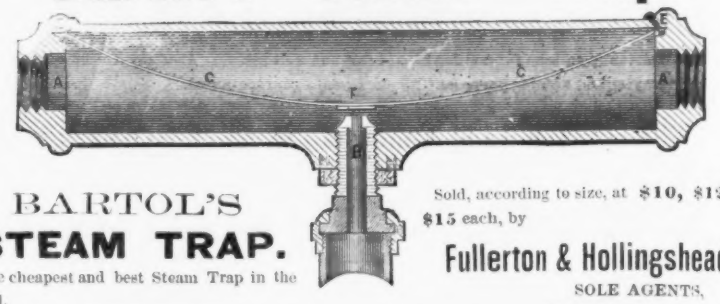

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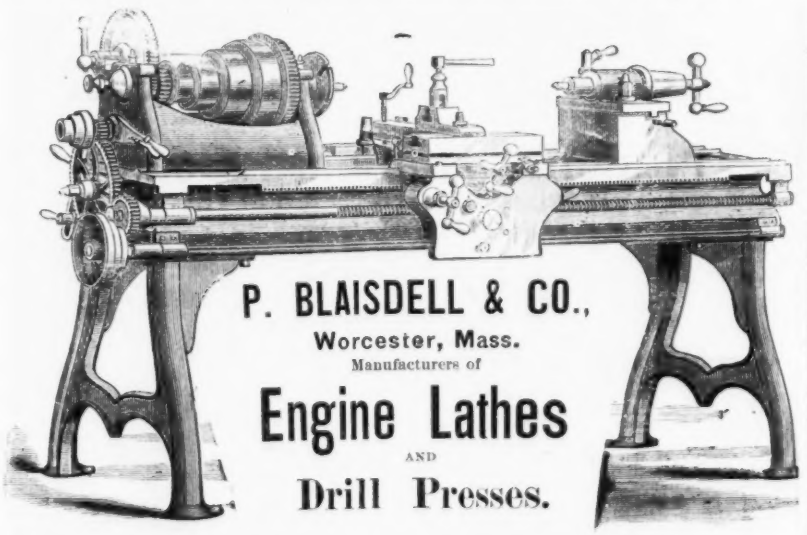

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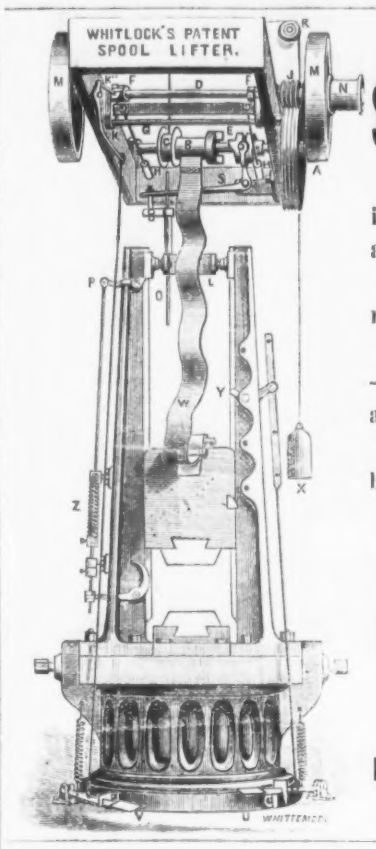

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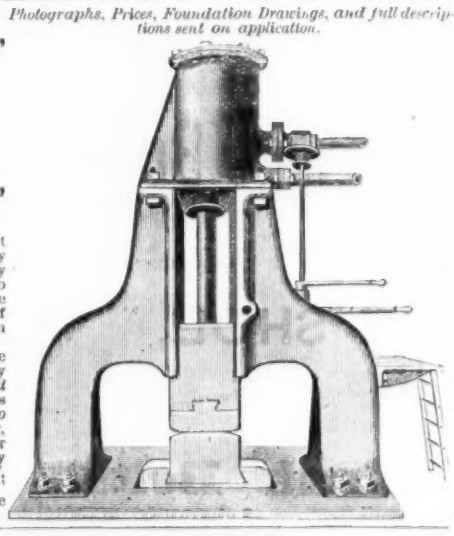

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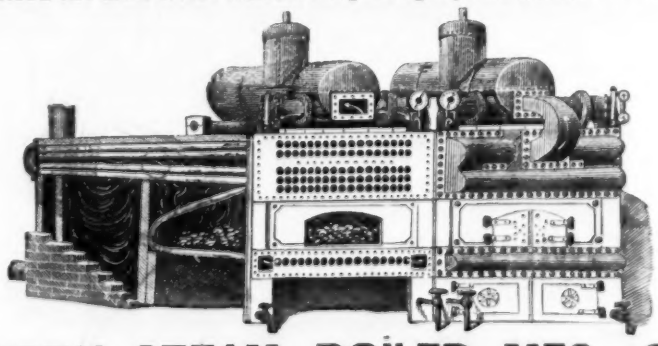

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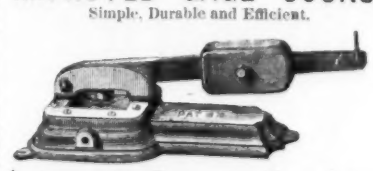

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